



Minicam Photography

MARCH 1949 25 CENTS 30 CENTS IN CANADA

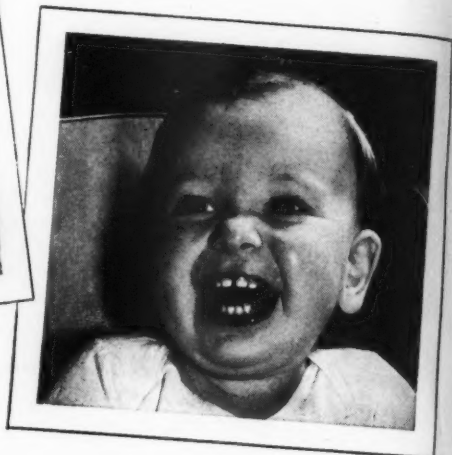
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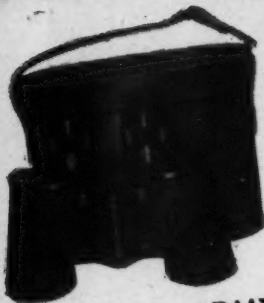
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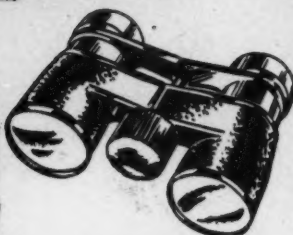


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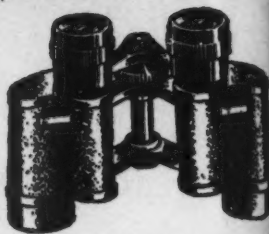
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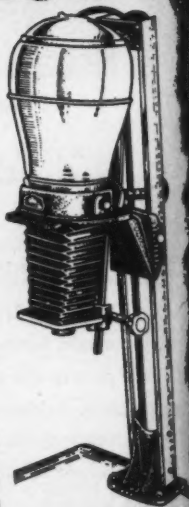
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***survey of graduates of past two years**

Minicam Photography

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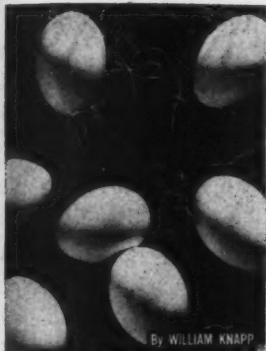
Cover by R. PerLee

Shooting the Stars—page 30

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By WILLIAM KNAPP

2. Food for thought is provided by case histories of SMP graduates who have "made the grade" in professional photography! Case in point is WILLIAM KNAPP (see above). Before coming to the School, Knapp had had experience only in the mechanical phases of photography. Now that he has mastered the creative side as well, at SMP—Knapp will work in color with a food-photo specialist.



By MILTON COHEN

accomplished shot by SMP student MILTON COHEN (see above). Photography was only his hobby pre-SMP . . . now "Milt" is all set to join a large New York studio. Says Milt, "I'm very pleased with the instruction at the School!"

Approved for Veterans Training under PL-346 and PL-16

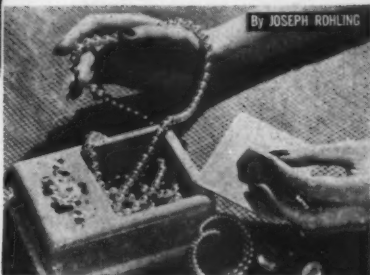
4. This is the way to photo-success! "Springboard to fame" for careerists of all ages is SMP, where specialized courses and advanced techniques are available. *Tuition fees?* Surprisingly moderate for complete study programs, day or evening. For outline of courses, visit SMP—or write H. P. Sidel, Director, Dept. M-3.

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1. Beacon light for camera careerists are the professional courses at SMP! Here the outstanding photo-faculty, the "strictly professional" studios and labs combine to bring out the best in each student. Graduate who came, studied, and is now reaping his reward is ROBERT WATTS, Jr. (see right). Bob has joined a studio in his home state of Mississippi, and is doing free-lance feature stories to boot!



By ROBERT WATTS, JR.



By JOSEPH ROHLING

3. Pearl of a shot is this unusually fine rendition of a most difficult subject by JOSEPH J. ROHLING (see left). Yet Rohling had had no experience at all behind the lens until he came to SMP! Now a graduate, Rohling plans to join a New York commercial studio, doing fashion photography in black and white and color. His thorough SMP training is certain to help him get ahead—fast!



By PRISCILLA MABIE

4. Beloved of women is the art of fashion photography, and many a feminine SMP graduate has carved an excellent career in this field. We predict that talented PRISCILLA MABIE (see right) will "go and do likewise!" A University of Iowa graduate, Miss Mabie took her B.A. in art and design, used photography as an adjunct to her art work, then decided to make it her career. Priscilla says she chose SMP on the basis of excellent recommendations. As a graduate, she will put her training to work in a mid-west Studio.





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WRITE TO DEPARTMENT "M"



THE LAST WORD

Cuban Voodoo

Sirs:

In your October issue which I have just read
now on account of a trip out of town, I have
seen a very funny article. It's signed Earl
Leaf in "Isle of Rhythm."

Mr. Earl Leaf went to Haiti, Cuba and Ja-
maica making some snapshot of the voodoo
dance! Really, that's something very difficult
to foreigner, even for us white men. I have
been lucky to see some of them, but never
could see a white man. I am surprised of
Mr. Leaf.

But this magnificent story is spoiled when
he starts to talk about it. Mr. Leaf is sur-
prised why legislation and police regulation are
directed against those form of art and not when
the same thing happens in a cabaret. That's
because he is a tourist. If he wasn't it
would be easily to know voodoo dance ends
always in a fight. Voodoo means a man pos-
sessed by devils and he must drink human
blood to get rid of them. They always kill
after dance has finished, but it never happens
to be one of voodoo dancers or spectator. The
victim has to be a white boy or woman who
knows nothing "that voodoo night is for her."
When you see a conga rumba or voodoo dance
in a cabaret, it's not what you think: it's merely
a show for tourism.

Mr. Leaf also think voodoo dance happens
only in Haiti. He very, very wrong. It's
something very usual in Cuba. Many nights
I've heard drums with his peculiar tam tam.
Police run along the whole nation every day
looking for a killer after dancing. I'm telling
you so because perhaps I'm one of those few
white men that understand perfectly voodoo
language (ñañigo) and what's more, I play
drum as well as any of them. Of course I'm
not a ñañigo. If I were so it would be very
difficult to me writing this things. So, if you
see Mr. Leaf, tell him my compliments for such
wonderful snapshots but tell him too not to
come around as a tourist and I'm sure he is
going to write many surprising facts.

Chacón 205, bajos, MERLINO CREMATA
Habana, Cuba

• We don't know a tam tam from a ñañigo,
but we do know Earl Leaf well enough to thank
Mr. Cremata on his behalf as well as our own
for volunteering a different slant on Voodoo
rites.—Ed.

Why Envy An Owl?

Sirs:

On page 26 of your January issue, you men-
tion the fact that "an owl can contract either
pupil of his eyes independently of the other."

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light and a mirror. This fact was known and

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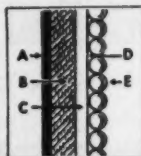
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Miami Beach, Fla.

MELVIN S. KAYE.

"MINICAM" A Misnomer?

Sirs:

I've read MINICAM off and on ever since you ran an article on Champlin 16 developer years ago (Nov. 1938—Ed.), and I wonder if you haven't outgrown your name. Back when you started, miniature cameras were the rage; now since you actually cover all phases of photography, your name is a misnomer. It isn't any worse as names go than *Saturday Evening Post* or *Country Gentleman*, of course, so if they can get along, maybe you can too. Anyway, it's a suggestion.

Pasadena, Calif.

FRANK HOBALT

•A mighty interesting suggestion, Frank, and we wonder if other Minicam readers join you in wanting the name changed to a less limiting title. We would like some suggestions.—Ed.

Charles B. Phelps, Jr., a fine photographer and a leader in many organizations for the advancement of photography, died January 18. His Presidency of P.S.A. was outstanding, and we feel fortunate in having known the warmth of his friendship, and having received the benefits of his knowledge of photography. The Editors.

Two Cover Shooters From Santa Barbara

EDITOR, MINICAM:

WHOOFS THANX FOR COVER CONTEST CHECK AND MENTION IN JAN. ISSUE WRITE-UP ABOUT CONTESTANTS. BUT WHOOFS AGAIN. CREDIT GIVEN TO VIRGIL MACK AND BOB HEMMIG FROM SANTA MONICA. BOTH WRONG. MACK NOT CONNECTED WITH COVER AWARD AND IT'S SANTA BARBARA. PLEASE DELETE MACK AND THAT FOREIGN CITY, HUH?

SANTA BARBARA. BOB HEMMIG.

• If delegates from the Santa Monica C. of C. leave you in a condition to enjoy your cover

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Solar, 2 1/4 x 2 1/4, F4.5 lens.....	89.18	67.50
Solar, 4x5, w. cond. (no lens).....	140.00	119.00
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Thalhammer B/L, w. Panhead.....	24.50	19.50

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Arkay A20, Chrome, 18x24.....	50.40	42.45
Lott Roto, 12", chrome drum.....	22.30	17.95
Lott Roto, 24", Prof., 24" chrome.....	33.47	26.75

(Shipping costs not included)

Brand New Combination Offers

	List	Your Cost
ARGUS C3, 35mm F3.5 ctd lens, cpld R.F., Flash gun.....	69.58	69.58
Ever-ready case.....	8.50	8.50
Comb. Shade & Filter holder.....	4.50	3.30
Set of 3 filters w. pouch.....	6.00	3.95
2 rolls, 36 Exp. Fresh Pan.....	2.28	2.28
Total Value \$90.86 . . . YOURS for \$77.79		

Above items may be purchased separately

ARGOFLEX Model 1, F4.5 ctd lens.....	\$61.13	\$61.13
Ever-ready Carrying Case.....	8.50	8.50
Comb. Shade & Filter holder.....	4.10	3.15
3 filters.....	6.75	4.50
Tolex (Hinson) Gadget Bag.....	8.50	8.25
Total Value \$88.98 . . . YOURS for \$71.89		

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shot when it is published, Bob, you'll find we have made proper corrections.—Ed.

How This Month's Cover Was Made

Sirs:

Because action-color photography is one of the most exacting of all fields of photography, I am especially pleased to have one of my pictures appear on MINICAM's March cover. I feel that this is one of my better pieces of work in technique as well as from the standpoint of good peak action.

This transparency was taken during a basketball game between Harding College and Brooks Institute of Photography, both of Santa Barbara. Lighting used was nine No. 22 flashbulbs in individual reflectors placed twelve feet from the point of action. The exposure at F:5.6 was for 1/400 sec. duration, with Type B Ektachrome and the proper correction filter.

Santa Barbara, Calif.

R. PERLEE.

* Before we got around to printing PerLee's cover shot, he left Santa Barbara. For the record, he is now a citizen of Fowler, Colo.—Ed.

Which Paper Should I Use?

Sirs:

Your article *Which Film Should I Use* plus the photo data sheets on *All The New Film Speeds* formed a complete package on the subject and I wouldn't trade off my December MINICAM for a flock of greenbacks. Not, that is, if I couldn't replace it. But now I want to know about printing papers. Any chance of a complete article on this important subject?

Bar Harbor, Mich.

L. M. KLINGMANN

* Thanks, and yes. A definitive article on printing papers is on its way.—Ed.

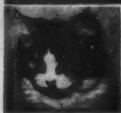
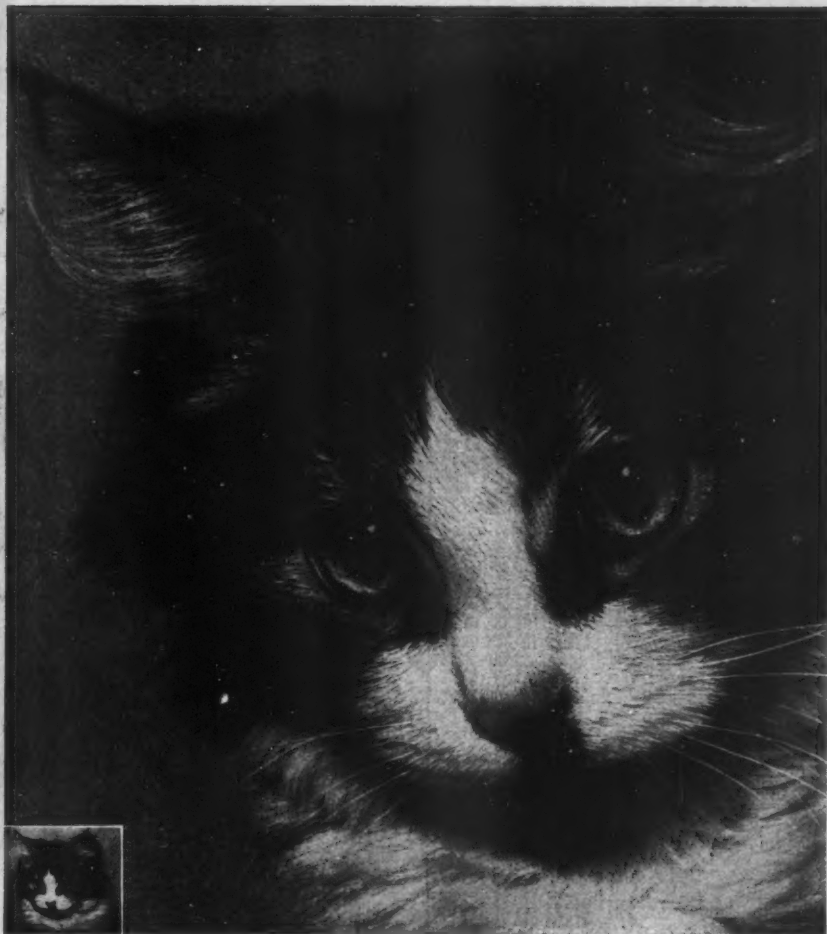
Mr. Cheng Gets Around . . .

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Leica 111, cpid, F3.5 Elmar, cc.	134.00	112.00
Leica 111A, cpid, F3.5 Elmar, cc.	149.00	120.00
Leica 111A, F2 Summar, cc, ctd.	149.00	115.00
Leica 111A, F2 Summar, cc, ctd.	179.00	140.00
Leica 111A, F2 Summar, cc, ctd.	235.00	180.00
Leica 111B, F2 Summar, cc.	248.00	175.00
Leica 111C, F3.5 Elmar, ctd, cc.	\$290.00	254.00
Leica 111C, F2 Summar, ctd, cc.	388.00	378.00
Leica 111C, F1.5 Xenon, cc.	208.00	225.00
Contax I, F2.8 Tessar, cc.	92.00	130.00
Contax I, F2.8 Sonnar, cc.	100.00	135.00
Contax II, F2.8 Sonnar, cc.	100.00	195.00
Contax II, F1.5 Sonnar, cc.	249.00	278.00
Contax III, F2.8 Sonnar, cc.	278.00	289.00
Contax III, F1.5 Sonnar, cc.	278.00	310.00

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Gen. Leica Ready case	22.50	\$ 5.00
Leitz Copying Attach	44.27	33.80
Leitz Chromo Vidom Finder	71.80	48.00
Leitz Image Recting Finder		74.00
Leitz Leica Motor	123.20	78.00
28mm F3.5 Elmar Lens W.A.	98.00	49.00
30mm F3.5 Elmar Lens	225.00	148.00
30mm F2 Summar Lens		139.00
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50mm Sonnar F1.5 ctd, F1.5	188.00	138.00
Univ Revolving Finder for Contax		95.00

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Mercury II, F2.7 ctd lens, cc.	672.50	39.50
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Argus C2, F3.5 ctd, flash, cc.	29.95	22.00
Perflex 101, cpid, F4.5 ctd.	85.00	88.00
Perflex Deluxe, cpid, F2.8 ctd, cc.	85.00	82.00
Seisley 28, cpid, F2.8 ctd.	79.00	49.00
Seisley 11A, F3.5 lens.	197.00	185.00
Kodak 38, W/rdr, F3.5 ctd.	88.38	82.00
Ikons 28, F3.5 lens, case	82.00	83.00
Practiflex, F2.8 ctd lens.	89.00	82.00
Kodak Bantam Spl, cpid, F2 lens, cc.	148.00	100.00
Binox, F3.5 lens	179.00	135.00
Kine Exakta, F3.5 Tessar, case	230.00	180.00
Kine Exakta, F2.8 ctd.	210.00	289.00
Giurus, cpid, F3.6 ctd lens	116.25	82.00

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Univ, Reamer II, F4.5 ctd.	48.00	35.00	27.00
120 Monte Carlo, F4.5	48.00	36.00	27.00
120 Adon Folding, F4.5 Schneider	49.50		
Monte Carlo Mini, F3.5	43.75	47.00	38.00
Monte Carlo, F3.5 Special	43.75	47.00	38.00
Super Ikons A, Tessar F3.5, cc.	195.00	129.00	80.00
Super Ikons B, F2.8 Tessar, cc.	284.00	169.00	145.00
Super Ikons B, F2.8 Tessar, cc.	284.00	169.00	145.00
Medalist II, F3.5 Elmar, ctd, cc.	312.00	195.00	180.00
650 Kodak Tourist			
F4.5 ctd, Flash Shutter	71.00	55.00	40.00

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Ciroflex, F3.5 ctd Alpha, cc.	85.48	82.50	82.00
Ciroflex, F3.5 ctd Beta, cc.	107.15	84.00	71.00
Ciroflex I, F3.5 Novar, cc.	111.00	79.00	80.00
Relicord IIA, F3.5 lens, cc.	187.00	215.00	180.00
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Suva, Fiji Islands C. L. CHENG

Why Picture Editors Turn Gray Sirs:

In the November 1948 MINICAM Picture Section, page 69, there is a photo by Derald Martin which you say was enlarged through a piece of glass with water sprinkled on it. All I want to know is: How was that picture really made?

I have made over 30 prints, 30 odd ways, and water sprinkled on the glass always gives me black stars or white rings. Enclosed is a print to show you what I mean. I get MINICAM



every month and have tried dozens of ideas suggested in it in the past with swell results. But not this time. What gives?

Kokomo, Indiana K. E. BAILEY

• It gives our Picture Section Editor a dark cell, a chamois cloth, and a glass negative carrier. Until he polishes the Newton rings out of the glass, he stays in the cell. Seriously, the picture was unintentionally misconceived, and here is Derald Martin to set it straight.—Ed.

Derald Martin's Explanation

Sirs:

Justified protest from your reader is finger of poetic justice pointing at the schmoos (I love schmoos) who edited my original dope on the photo. I distinctly remember giving the correct information with the picture and I'm not surprised with the result. I tried that water-on-the-glass stuff three years ago and discarded it. Anyhoo—this is how my picture was made:

I placed a large ferrotype tin (clean and dry) on a flat table. The camera was set up
(Continued on page 105)

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writes *Al Hauser*

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PHOTO MARKETS



BY KIRK POLKING

THE SATURDAY EVENING POST, The Curtis Publishing Company, Philadelphia 5, Penna. The majority of photos in this magazine illustrate articles and are assigned to freelance photographers in different parts of the country, some of whom have a working arrangement with the magazine. In addition, The Post runs picture stories of both black-and-white and color, which tell a complete story in themselves, with captions and a short text. The best way to submit ideas for picture stories is in the form of a letter or outline specifying all the important facts. In black-and-white, 11x14 prints are desirable. In color, 4 x 5 and 3 1/4 x 4 1/4 are most often used, although 2 1/4 x 3 1/4 and 2 x 2 are also acceptable. Anything smaller is not a workable size for their purposes. Return postage should be attached to unsolicited suggestions. Payment for purchased material is made upon acceptance.

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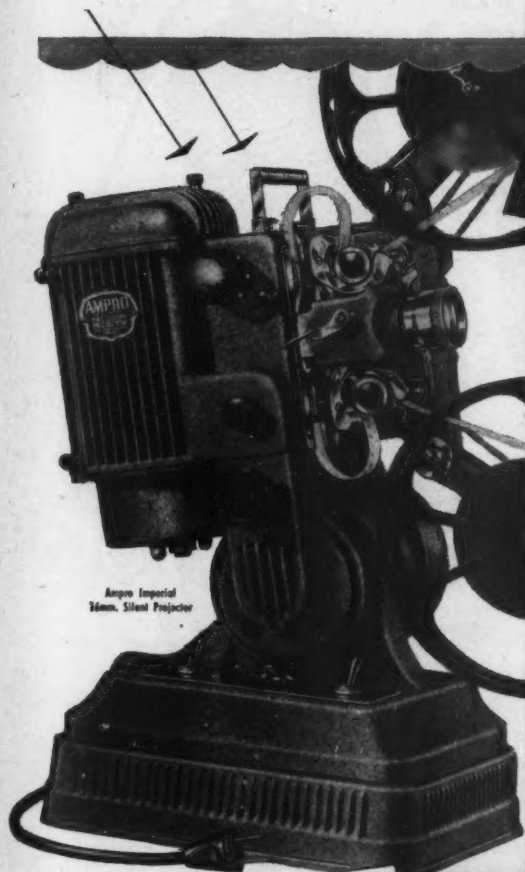
NEWSWEEK, Broadway and 42nd Street, New York 18, N. Y., is interested in exclusive news and news feature pictures in 8x10 glossy prints. \$12 and up will be paid for any such pictures used on publication in the magazine.

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OUR DUMB ANIMALS, 180 Longwood Ave., Boston 15, Mass., in a search for "story-telling pictures," announces its annual photographic contest to end June 15, 1949. Cash prizes amounting to \$95 and ten subscriptions to **OUR DUMB ANIMALS** are offered for clear outstanding photographs of wild or domestic animals and birds. All contestants should strive for pictures that tell a story—pictures, for instance, of wild life feeding or building homes, or of domestic animals in surroundings showing care and thoughtfulness for their comfort. Following are Rules of the Contest: Entries accepted only from those who *have taken* the photographs but anyone may compete—pro or amateur. No pictures less than 4 x 5 accepted and no negatives, only good, clear prints, *preferably glossy finish*. Subjects must be live animals in their natural environment. Unnatural poses, or pictures of animals hunting, performing, or in captivity will not be considered. Photographs depicting recognizable persons should be avoided unless full consent for publication is obtained. Prizes may be withheld until "releases" are obtained in such cases. Ingenuity shown in choice of subject matter and its composition count equally with photographic qualities and pictures may be given titles if desired since titles often help in telling the story. All photographs must carry plainly on the back, full name and address of sender. Prize-winning photographs become the property of **OUR DUMB ANIMALS**, which reserves the right of reproduction at any time and in any manner. However, **OUR DUMB ANIMALS** does not demand exclusive rights and the photographer may make such other use as he sees fit. Photos not winning prizes will be returned *only* if full postage is provided. Closing date is June 15, 1949. Entries should be addressed: Contest Editor, **OUR DUMB ANIMALS**, 180 Longwood Ave., Boston 15, Massachusetts.

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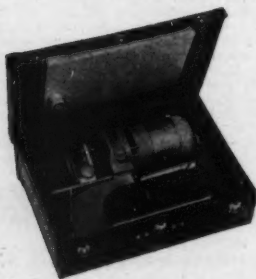
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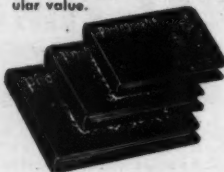
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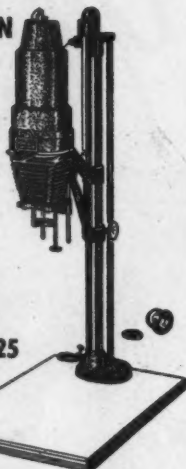
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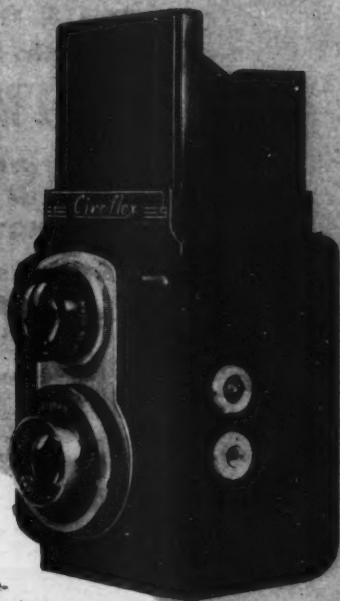
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procedure, as indicated in the diagram above. If your equipment does not include a flash synchronizer, you can still take advantage of SUPERFLASH high-speed light output by using the "open-flash" technique. For details write Wabash Corporation, 500 Fifth Ave., New York 18, N. Y. (A subsidiary of Sylvania Electric Products Inc.)

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YOU can take pictures



LEFT—HERE ARE Michael and Fay Kanin the day they boarded the Super Chief to bring to Broadway the smash comedy hit "Good-bye, My Fancy."

RIGHT—THE SKY was a deep enough blue so that no filter was needed, and the grain in the wooden fence made a pleasant textural contrast to the fluffy clouds. I tilted my Rollei, preferring a diagonal fence line to a straight one, because either a vertical or horizontal axis can give a static effect that I try to avoid. I asked the Kanins to lean well over their hands. This prevented foreshortening of the hands.

I CAN BEST BEGIN by telling you a true story.

About a year ago Walker Evans, who is a fine painter as well as an outstanding photographer, was in California and gave Virginia Campbell two painting lessons. They were inspiring lessons and had wonderful results. Virginia had never painted before and since then has sold several pictures.

Walker's first lesson was, "If you can love, you can paint." And his second lesson was, "Don't be afraid of your materials. Don't be afraid of wasting them because you won't be wasting them anyway. That's how you learn."

Painting and photography are not identical, but these painting lessons are just as valuable for photographers. The assumption in the story—and apparently, as it turned out, the truth—was that someone really wanted to paint. Well, my ad-

vice is for someone who really wants to take pictures and needs a lift to help him start. Take pictures of someone or something that you love, or at least of something that really spells you. It does not make much difference what. Weston is spelled by driftwood, for its romance or decay or whatever way you think about it. And Walker Evans by houses, and by people who have made them or lived in them or failed to live a full life in them. And fashion photographers, the good ones, anyway, are spelled by chic. Take what you like, the subject is relatively unimportant, but your intensity of feeling about it is altogether important. I happen to be spelled by people.

It's because I like people, I believe, that these two pictures, of Mike and Fay Kanin and their son, Joel, are agreeable.

Although I like both these pictures, it

(Continued on page 125)

like these

By FLORENCE HOMOLKA





THE BOWLER, above, was shot at 1/400 second at F:22, using a No. 5 flashbulb fired at a distance of 15 feet. Slightly underexposed, the negative was saved by giving it 25% overdevelopment in DK-60a. The Golden Gloves tournament picture, opposite page, was shot on Super Panchro Press Type B film having a tungsten rating of 100 ASA. With a shutter speed of 1/10,000 second at F:15, the negative was badly underexposed when one of the two strobe units that had been set up failed to fire. 100% overdevelopment in DK-60a finally saved the negative by giving it enough density to be printed.

TEXT BY JIMMY KYLE
PHOTOS BY BOB EAST

IF YOU are as sceptical as I used to be, you probably don't believe those bits of technical data that you see on news pictures reading "shot at 1/000 at F:11 on Super XX in medium light." I didn't believe them either, until a friendly sports photographer on the local paper was showing me some of his work and told me what speeds and film the pictures were made with.

He kept referring to those unbelievable speeds. Finally I interrupted him. "How," I demanded, "can you shoot at those speeds without getting a negative too underexposed to print?"

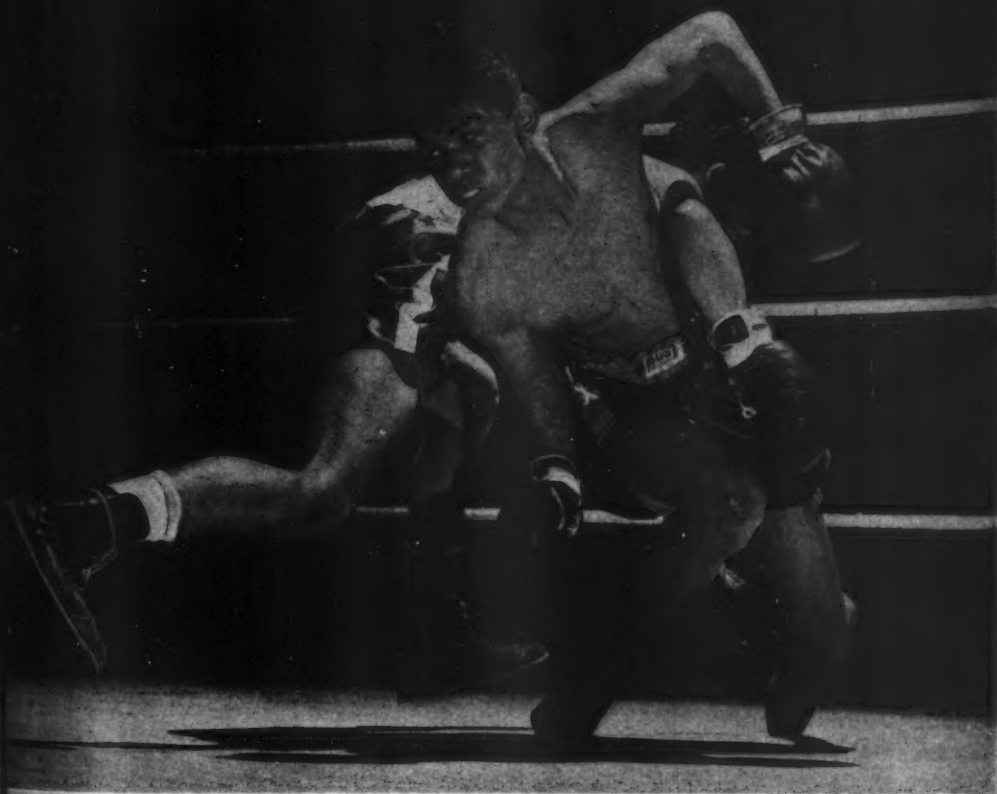
Grinning widely, he let me in on the secret. And like most photographic tricks, it was very simple.

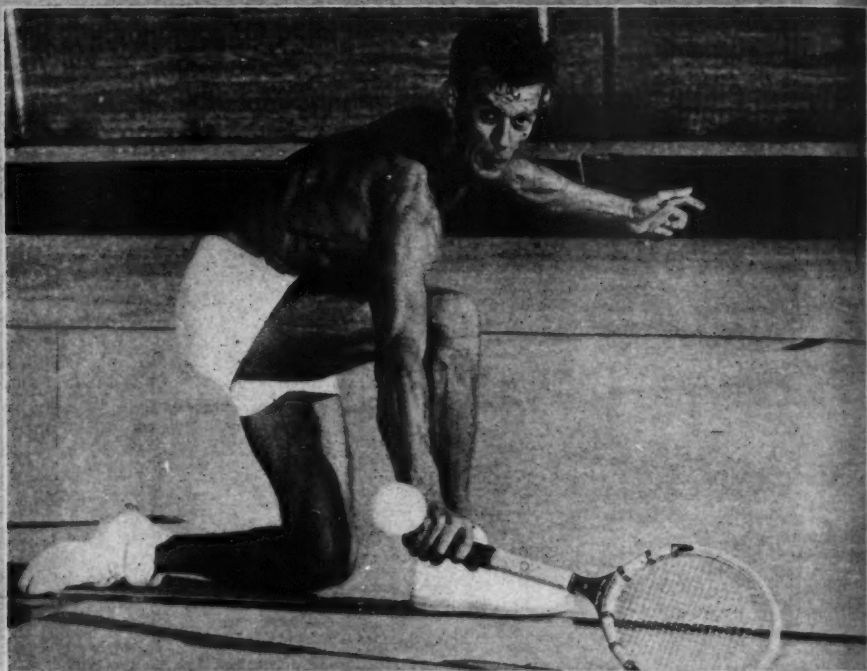
The secret lies in the relationship between the exposure and development of a negative. Standard speeds are correct for standard development, but when development time is lengthened, speed is increased. Therefore, if you want to double the speed of the film, increase the time of development by 50%. Doubling development gives an approximate speed increase of four times. The technical boys will probably want to argue this, saying that maybe the negatives get a little density, but they'll also be too full of contrast to print. Maybe so, but the photos with this article were treated that way, and they went on either number 2 or number 3 paper—the ones with double development took number 3.

I know the idea sounds crazy, but it works. If you don't think it will work, do like I did—try it!

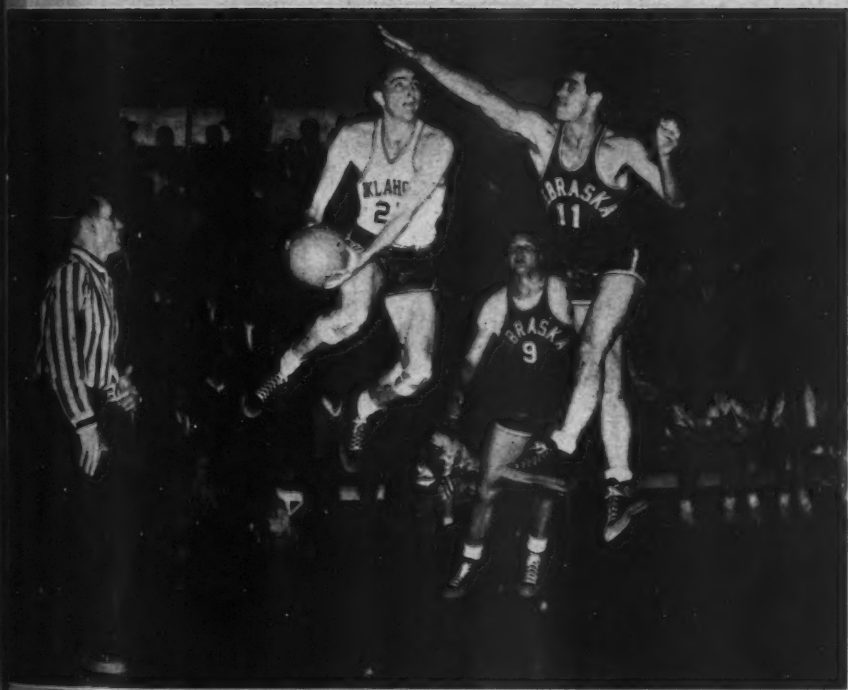
it's never too dark

Here are the exposure-development tricks newspaper photographers use.





FILL-IN flash was used for the picture at the upper left (opposite page) to balance the strong side lighting. With the flash about 25 feet away, the picture was made on Panthro Press Type B film at a shutter speed of 1/1000 second at F:22. Overdevelopment of the negative amounted to 50% of normal. The three car smashup at the midget auto races (lower left) was shot at 1/10,000 second at F:11 from a distance of 50 feet. The strobe unit used for lighting had a power rating of 140 watt-seconds—which was comparable, in this case, to that of a lightning bug in a paper sack. To save the negative, it was given 125% overtime development (16 minutes in DK-60a instead of the normal 7 minutes). The basketball picture, below, was shot at 1/1000 second, F:16. The action took place 25 feet away and the illumination consisted of two No. 31 focal-plane flashbulbs. Overdevelopment in this case amounted to twice the normal development time.



shooting the stars

By TONY KARNOSH

You can enjoy this story in two ways. Tony Karnosh has created some interesting pictures, full of the mystery of the night which are a pleasure to see. Or, perhaps you would like to try your hand at making some pictures like these. In that case you'll have to make the camera mount and attach a telescope for sighting your camera. This will take some mechanical ability and time. In either case we hope you enjoy this fresh approach to photography at night. THE EDITORS.

TO THE STRUMMING of a dulcimer, the playwright Christopher Marlowe had his fair Helen wooed with these words:

"O thou art fairer than the evening air,
Clad in the beauty of a thousand stars."

Photographers, too, have a love for the sky, its scampering clouds and moods of storm and beauty; in outdoor shots they often give half of their space to the picture above the horizon.

But why neglect the star studded or moon-accented night sky? Surely not because it lacks romance or poetry. The truth is that the person who tries to photograph the night heavens is often so disappointed in his results that he either fakes it or gives the job up as impossible.

Actually, it is fairly easy to get good moon and star images into your pictures if you go at it right. To begin with, you

THE NIGHT VIGIL of an ancient sentinel standing guard beneath a starry firmament isn't to be had by simply clicking a shutter. This print was made from two negatives, one of the landscape, and the other of the stars. In combining such negatives, be sure that the constellations are in proper relationship with the horizon.

S

must prepare for a long exposure. If you wanted to make a salon shot of a starlit scene with a short exposure, your film emulsion would have to have a speed rating of about ASA 180,000. Even with this super film, a fully exposed negative would require an aperture no smaller than F:4.5, and an exposure no shorter than one second. Due to the motion of the earth, an exposure longer than one second would begin to elongate the star image.

Even with the fast films available, a fully timed negative requires an exposure

running into minutes. It is almost impossible to over-expose stars, because they are pin-points of light; the longer the exposure, the more stars we record and the larger and brighter they become. Since we need an exposure of from 15 to 30 minutes, and since the earth won't stand still while we make it, a gadget that will hold the camera still in relation to the stars is required. Once we have a picture of the heavens, we can print in various foregrounds from separate negatives.

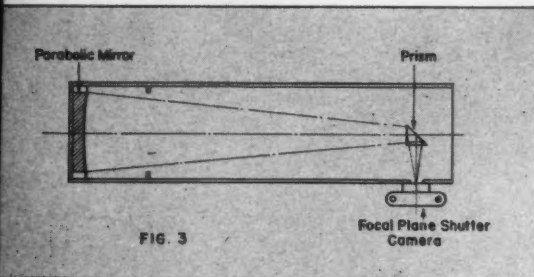
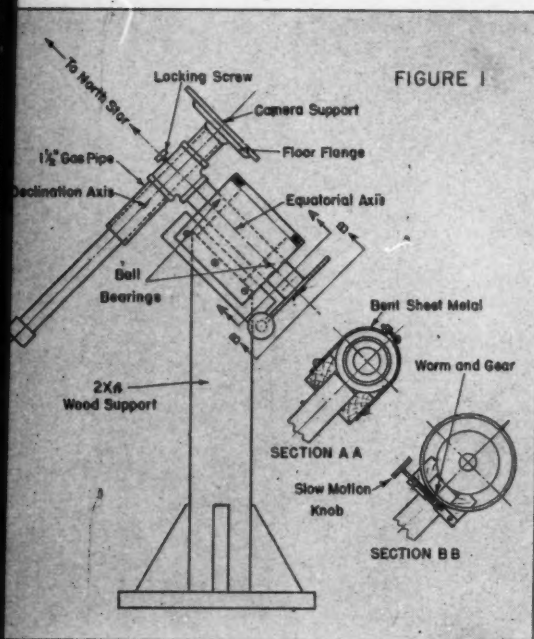
All that is required for making the camera-supporting device shown in the accompanying Figure I, is a strong wooden base, a few pieces of gas pipe, the old auto transmission ball bearings, a worm and gear, a small six or eight power telescope with cross hair eyepiece, two iron straps and a few turn screws.

The main or equatorial axis is mounted in the two bearings and fastened onto the main post as shown in Figure I. This axis must be parallel to the axis of the earth when making exposure. To determine this angle, sight through the pipe and center it on Polaris (the North Star). This is not the true axis point, but is accurate enough for this purpose. The pipe must rotate smoothly and accurately in these bearings or an inferior star image will result. If the diameter of the pipe fits too loosely in the inner race of the bearings, it can be bushed with narrow pieces of thin metal until it fits very tightly.

Next screw on the declination axis which consists of a tee and two nipples as shown. Through this pipe is slid a smaller pipe with floor flange to support your camera on one end and counter weight on the other.


The tee is tapped for a locking screw. It is not necessary to have a close fit on this axis as it does not move once you have the camera aimed at the desired part of the heavens.

At the lower end of the equatorial axis, we have our slow-motion worm and gear with hand turning wheel. A stock worm and gear can be bought at the Boston Gear Works (they have branches in most





MORE impressionistic than realistic, this picture was made by double-printing a moon negative with a straight silhouette negative made at sundown. To get king-size pictures of the moon you need a lens of at least 40" focal length or a reflecting mirror equally as powerful. With this setup, however, you can snap moon pictures with exposures as fast as 1/50th second.



cities). A flexible cable is more desirable than the wheel to prevent jarring during exposure. The guiding telescope can be made very reasonably by using salvage lenses, tube and cross hair reticule. (Edmund Salvage Co., Audubon, N. J.)

After locking your camera onto the floor flange by means of your tripod socket, fasten the guiding telescope onto the camera very firmly with scotch tape or other means, so it will not move during the exposure. Point the camera at the desired portion of the sky and sight the finder telescope onto the nearest bright star in its field. The cross hairs may be a little hard to see at first but as your eye gets accustomed to the weak light you should not have difficulty keeping the star on the center. Of course, the camera will rotate from east to west. A little practice with the rotating screw will be required before you get a perfect nega-

tive. If the star strays from the equatorial track it indicates that your axis is not pointing directly north and will require readjustment. Try a short exposure first and increase it as you acquire skill in guiding. (See Fig. 2.)

Develop your negative to the greatest gamma you can, without fogging. Examine it with a magnifying glass to judge the shape of your images. You can use this negative just as it is, or you can make a positive transparency on portrait film and rephotograph it to give the points of light star character.

When you have succeeded in getting a good star negative, choose a suitable foreground or go out and make one to fit. The simplest and best are plain black silhouettes with pure white sky made on contrast film. The star negative is first printed, shading it from a medium dark sky to black at top and then double print-

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ing the foreground negative without moving paper on easel. A little experimenting will give proper exposure for each negative. If you have a negative with a nice graduated gray sky it is only necessary to bind the star negative to it and print both together to an overall dark tone. It will be necessary to bleach out with ferricyanide any stars which overlap into the foreground, or they can be spotted out on the final print.

To get reasonably large pictures of the moon will require a lens of at least 40" focal length or a reflecting mirror equally powerful. If you wish to take this matter more seriously you can purchase an aluminized 4 1/4" mirror for about \$25 (Lem Optical Co., 69 So. Lexington Avenue, White Plains, N. Y.) or a 6" one for \$40.

Construct a tube like Fig. 3. You can mount it on the same axis that you used for your star pictures in place of the camera. The moon can be taken at 1/50 sec. exposure on a slow film with this reflector. Remember to take the lens out of your camera when attaching it, as the mirror is your lens.

You can go still a little farther and equip your mount with a clock drive. I won't attempt to give any construction details on this because everything depends upon the type of motor, gears, etc., you are able to get. You'll have some research to do, too, in getting the proper speed.

In the event you want to grind and polish your own mirror you can procure kits and instructions from David William Wolf, 334 Montgomery St., Brooklyn 25, N. Y., or Precision Optical Supply Co., 1001 E. 163rd St., New York 59, N. Y.

Types of Subjects for Night Skies

Any outdoor scene can be treated to a starlit or moonlit sky providing it doesn't have clouds. Landscapes, industrials, street scenes, waterscapes, etc., make striking night pictures. So do winter scenes.

It would be a very good idea to visit your library and read up on stars and planets if you don't already have that knowledge. Don't print a full moon into a sky crowded with stars. Very seldom

will you see any but the brightest stars on an evening when there is a full moon.

Astronomy and photography are allied even if we do class one as art and the other as science. The first attempts at astronomical photography were credited to John Wm. Draper of New York. In 1840 he made a 20-minute exposure of the moon using the daguerreotype process. Due to the slow speed of his material it was impossible to photograph stars and it wasn't until the invention of the collodian plate in 1852 that progress was made. Today photography is the most important tool of the astronomer. You may never do any more serious astronomical photography than recording the moon and the constellations with your set-up, but the beauty that you will add to your pictures and the information you'll pick up about the stars will make you feel akin to them and your curiosity may take you far into the mysterious sky spaces.



STARS add realism to a night scene (opposite page) even though larger than they would normally appear. To get "points" on your stars (Fig. 2, above) re-photograph an enlargement from a regular star negative with a pair of cross-hairs between the elements of your camera lens. The cross-hairs can be mounted on a circular piece of cardboard and inserted behind the front element of the lens next to the diaphragm.

photographers you know

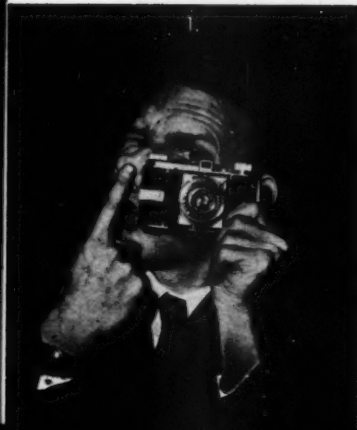


EVERY winter, along about February, we grow tired of being cooped up in an over-heated house and head for the hills where the ski-jumpers soar. We don't jump ourselves, you understand. We just want some fresh air and action shots. So we stand patiently at the foot of the ski-jump with freezing feet and reddening nose while jumpers whoosh by too fast for us to center them in the finder. We hope we don't look as frustrated as we feel after making ten exposures on thin air.

BY ERIC WAHLEEN

THE CREATIVE DESIRE is sometimes frustrated (Fig. 1) by a camera that seems better designed to fit into brick walls than around human faces. The "perfect" miniature camera of the future will have a hole through one side of the body to fit the proboscis of the user. UNCERTAINTY (Fig. 2) is another prime frustration. If we fail to think out a few pictures before the subject arrives, we are made barren of ideas by worrying about how much

it is costing us for the model to sit idle while we are trying to plan a picture. Then, after a picture is finally made, the second-shift of worries report for work. Was the diaphragm set correctly? Was the film wound to an unexposed frame? GRIM DETERMINATION (Fig. 3) is the only antidote for doubt. Shoot, and keep shooting until the film supply is exhausted and the model wants to go home. With luck you are bound to get something. Maybe.



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NOWADAYS you hear a lot about people being psycho-analyzed in order to ferret out their buried impulses, hidden frustrations, and the like. As yet there are no figures to show what percentage of the people being analyzed are amateur photographers, but if frustration is a clue they must be legion. On these two pages, Eric Wahleen, tongue-in-cheek, does a slapstick pantomime of feelings most of us experience while struggling with a little black box we alternately cherish and despise. Not that any of us give expression to our feelings the way this chap does. Dignity makes us put on a poker face when we feel like tearing the camera lens from bellows, or when we would like to see a gabby subject have momentary lockjaw. But burrowing behind the poker face, how many of these pictures reflect the way you have felt at times?



SAVAGE ABANDON (Fig. 4) is a "be yourself" attitude you may be able to cultivate. When you feel like this you say to heck with this "design for tomorrow" malarky. What this world wants is real down-to-earth action shots. You walk up to the cop on the corner and drop a paving brick on his bunions, then photograph the realistic action that follows. **ELATION** (Fig. 5) is a genuine

expression you assume when a pretty girl poses for your lens; the same expression is sometimes less sincere when your mother-in-law is the recipient. **HALLUCINATIONS** (Fig. 6) is the feeling you have after squinting through a view finder for a two-hour stretch. Medical scientists discredit the theory that descendants of miniature camera users will eventually come to inherit a single Cyclops eye.



LET'S DO SOME ENLARGING

BY GEORGE BOARDMAN

Enlarging your own negatives is half the fun of photography. Nowadays there is an enlarger to fit every negative size and purse. The special tools you can make yourself.



IF THE BIGGEST thrill a photo hobbyist experiences is that of seeing his first roll of film come dripping out of the hypo with recognizable images, the next greatest thrill is probably that of making his first enlargement.

One of the most pleasant things about enlarging is the fact that it gives you a "second" chance to pull a good picture out of a negative you thought you had muffed completely. If you originally stood too far away from Uncle Charlie, for instance, you can probably "blow up" his image so as to obtain a good sized print. You can also "crop out" the long underwear on the clothesline that you didn't mean to show in the picture, or "burn in" Uncle Charlie's bald plate so that from the brows up he doesn't remind you so much of a turtle egg. By tilting the enlarger or the paper easel a little, you can give Uncle Charlie extra height or, if he is a beanpole to begin with, shorten him. Each negative offers a chance for such an infinite amount of manipulation that it can yield dozens of different pictures. Aside from the actual shooting of a picture, in fact, no phase of photography lends itself as much to experimentation, control, or expression of ideas, as does the technique of enlarging.

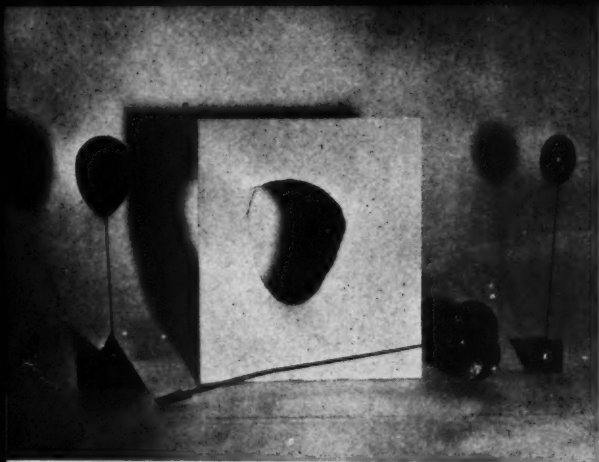
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A GOOD NEGATIVE often contains more than one interesting picture. The contact print in the upper left hand corner (opposite page), for instance, is from a negative that was exposed as a "grab shot" on a French boulevard. By enlarging one portion of this negative, the picture

at the left, (opposite page) was obtained. The remainder of the negative produced the altogether different interpretation shown above. Even an inexpensive enlarger will give you the enjoyment of selectively enlarging the best portions of your favorite negatives.

Photo: Francis Reiss



SPECIAL EFFECT tools (left) can be either made at home or purchased in inexpensive sets. The "dodgers" are small pieces of opaque material fastened to bits of wire. They are used as shown in the picture at the lower left to "hold back" some of the light from the enlarger when certain areas of a picture would otherwise print too dark. Lower right. A piece of cardboard with a hole in the center permits light to "burn in" or darken selected areas without darkening the rest of the picture at the same time. To illustrate this point, Boardman used a portrait on the enlarging easel; normally, the projected image would be a negative image.

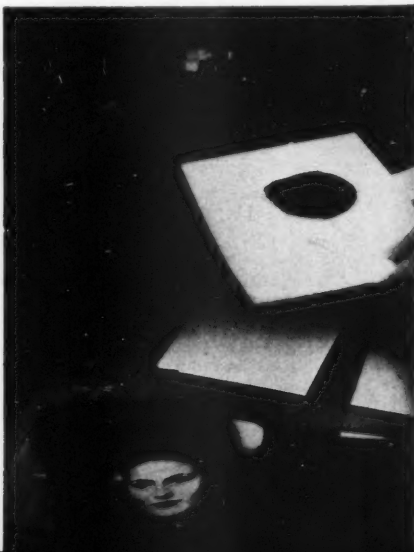
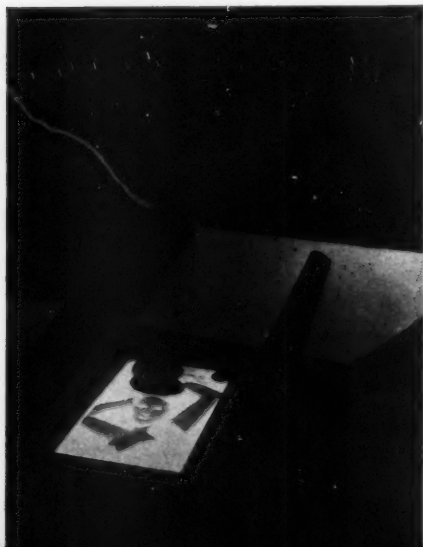
What To Look For In An Enlarger

The two main points to consider when you shop around for an enlarger are: (1) The enlarger must accommodate negatives as large or larger than your camera turns out. (2) It must have a price tag you can meet. A slender purse is no reason to be discouraged. Prices range from ten or fifteen dollars for small, used enlargers, up to several hundred dollars for the super colossal chrome plated machines. Somewhere in this range there is bound to be an enlarger for you.

Enlarger negative sizes range from the small 35 mm. size up to and beyond giant 8x10's for professional use. Several makes will accommodate roll and cut film sizes

from 35 mm. to $2\frac{1}{4} \times 3\frac{1}{4}$. All of the larger size enlargers such as $3\frac{3}{4} \times 4\frac{1}{4}$, 4x5 and 5x7 can also be used with the smaller film sizes by using special masks or negative holders.

Many enlargers come already equipped with a lens. In buying a lens for an enlarger not so equipped, be sure to follow the same rule that applies in buying a camera lens. The focal length of the lens, in other words, should equal the diagonal measurement of the negative in order to give complete coverage to your negative. If, for instance, the diagonal measurement of your negative is $3\frac{1}{2}$ ", the focal length of your enlarging lens should be at least $3\frac{1}{2}$ ". The one exception to this rule is





TO AVOID DISTORTION, it is often necessary to photograph a subject from such a distance that a negative includes more than is desired in the final print. At the left is a print from an entire glamour negative. Above, the final picture as "cropped" by enlarging.

Photos: Boardman



THIS modern darkroom was once an abandoned frame chicken house. Doing his own work when he could spare time and money, the owner converted it into a better darkroom than you will find in many studios. The big enlarger takes negatives up to 4 x 5" in size; the small enlarger handles miniature negatives. Many amateurs turn out excellent work in temporary darkrooms set up in kitchens and bathrooms. Several manufacturers now make enlargers that can be assembled in a few minutes and stored in compact containers when not in use.

when an enlarger is to be used for reductions.

Peculiar as it may seem, an enlarger must always be used when prints are to be made smaller than the actual negative size. Many of the enlargers which handle film up to 4x5 or 5x7 have a double extension bellows which enable the operator to make pictures smaller than the original negative size by extending the bellows and using a short focal length lens.

Enlargers with shorter bellows can be used for the same purpose if the bellows is extended by adding metal or cardboard tubes with the lens fastened to the end of the tube.

Regardless of the size film for which your enlarger is designed or the length of the bellows, there are two general types of enlargers. The most popular type for miniature negatives up to 2 1/4 x 3 1/4" size employs the condenser type of illumina-

tion. The condensers are extremely efficient in making use of the available light and project a more brilliant image for the wattage of light used than do the diffusion type of enlargers. Diffusion types employ opal, heat-resisting glass or a combination of the two for diffusion purposes. A comparatively new type of light source, the cold light fluorescent, requires neither diffusion discs nor condensers.

Although the diffusion type of enlarger requires a much larger lamp house for the more powerful lamp it uses, neither the condenser nor the diffusion type of enlargers require a great deal of darkroom space. A space about two feet square on a table, kitchen sink, or work bench, or the flat surface of a table-top kitchen range affords plenty of room for an enlarger up to the 5x7 size. Of course your wife may not like the idea of using her range for this purpose and suggest you keep the



ABOVE. The contact print from this negative shows two faults. First, the white beach slippers and the towel arrangement are distracting. Second, the camera was tilted. Below. Cropping has eliminated the distracting elements, and the subjects have been "straightened up" during enlargement.

Photos: Boardman



enlarger on the floor, but this isn't recommended unless you are impervious to backaches. And enjoy cleaning optical systems.

If you have an old chicken house, garage, basement, closet or other space you can convert into a darkroom you are in luck. If you must set up on the kitchen sink or in the bathroom for every enlarging session, you will probably want to purchase a compact enlarger that you can store in a minimum of space. Some of the newer enlargers are actually portable and can be dismantled and stored away in their own special cases.

Additional Equipment and Accessories

The extra accessories needed for enlarging do not require a great deal of expense or much extra space for storing. Some



ABOVE. Since this was intended as a publicity picture of an Oriental dancer performing the denouncement (Go Away Devil) portion of her ballet, a monotonous gray background was objectionable because it failed to focus interest upon the subject. This fault was easily corrected in the second enlargement (right) by "burning in" the corners of the print. Any portion of a print can be darkened selectively if it receives a "bonus" of light through an opening cut in cardboard or similar opaque material.

Photos by George Boardman



ONE of the most satisfying things about an enlarger is the control it gives you over the shape or format of your pictures. The Paris scene, opposite page, for instance, was originally photographed in a horizontal format on 35mm film.

Photo by Francis Reiss →

sort of easel or paper-holder to hold the enlarging paper flat beneath the enlarger is required. Plain, clear glass of correct size, home made easels with or without adjustable border devices, and a wide variety of factory-made easels up to 20x24 inches in size offer a selection to meet your purse and requirements.

Developing and fixing trays used for contact printing can be used for enlarging providing they are large enough to hold the bigger prints. "Diffusion" devices to soften the enlargements when such an effect is wanted can be made from cellophane, fine net, nylon, or other filmy material fastened over a hole cut in a piece of cardboard, or inexpensive diffusers may be purchased from most

(Continued on page 121)

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MARCH

picture gallery

You're invited to send photographs to the monthly picture gallery published in Minicam. How do you know what to send? That's easy! Just select the things you like best. We'll enjoy receiving them and pay you \$10 for each one published.



GEORGE
HUKAR

PHIL SCHULTZ—MAGNUM





PHIL SCHULTZ—MAGNUM

GEORGE KARGER





COURTESY SATURDAY EVENING POST FROM PIX



CLEM KALISCHER



LODER—FREE LANCE PHOTOGRAPHERS GUILD

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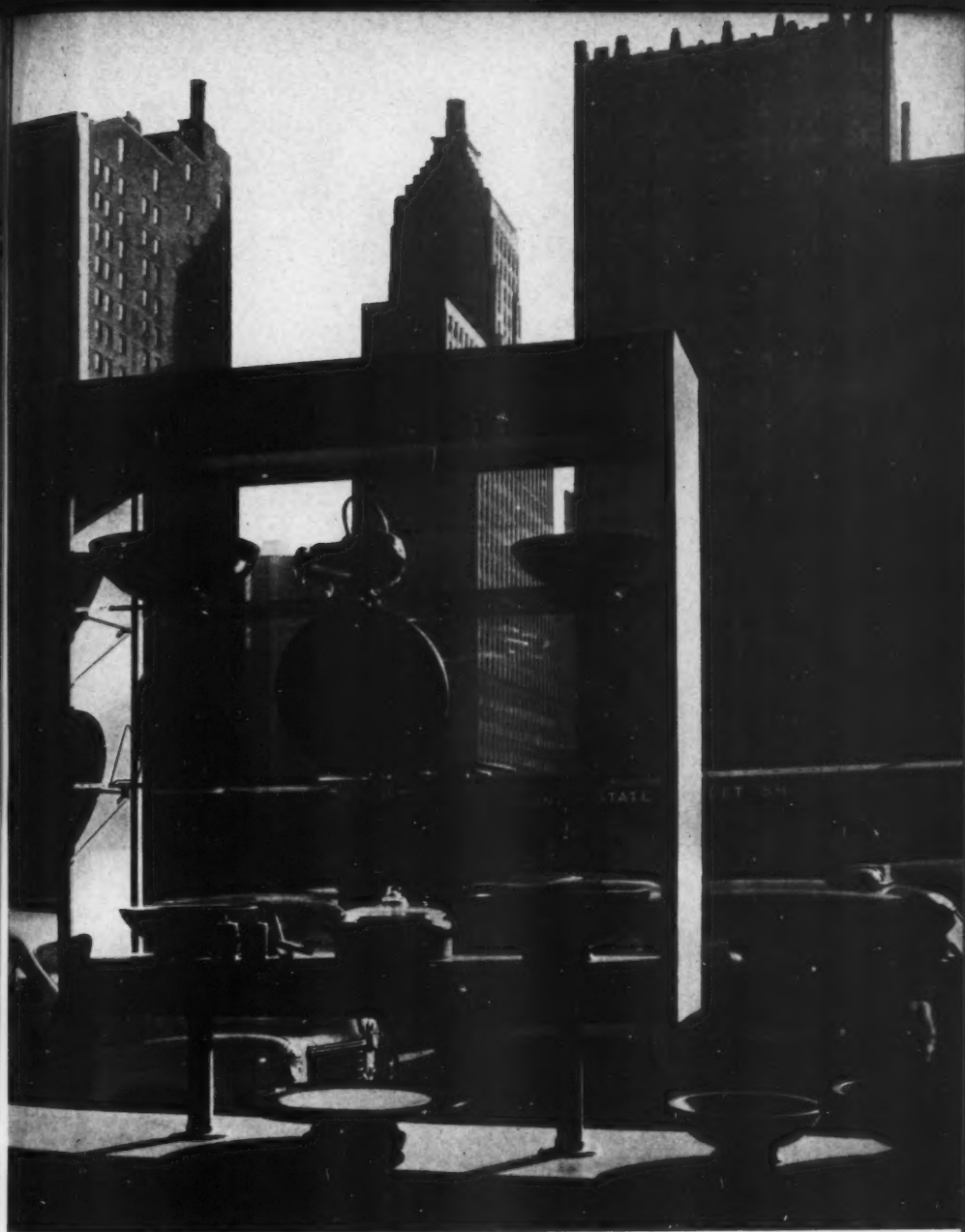


CALLAHAN



FITZSIMMONS

What you can



RAE RUSSEL

do with subtle use of light

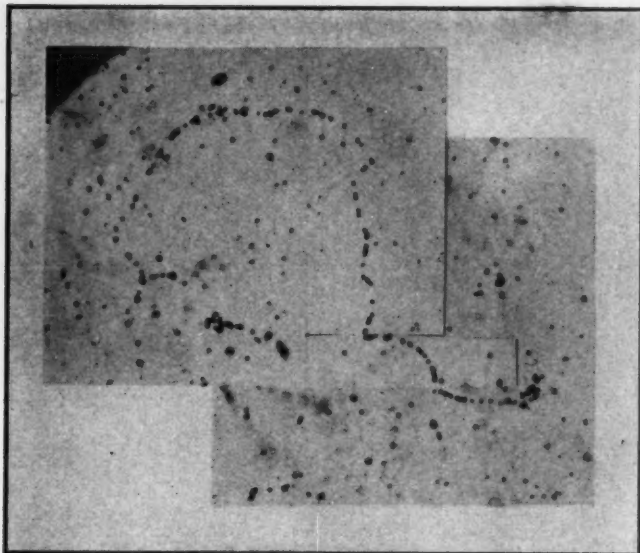
R. WINQUIST
SWEDEN



EDWARD WESTON







LONG dotted line shows the meanderings of an electron as recorded on Eastman's new ultra-sensitive emulsion—enlarged almost 900X.

BY DANE KRUGG

Tracking The Electron

A new photographic emulsion makes it possible for electrons to snap their own pictures.

IN THESE DAYS of atomic headlines, even the lowly electron has crowded into the limelight by "snapping" pictures of itself. The above self-portrait of an electron against a cosmic ray background, was made possible by Eastman's new ultra-sensitive emulsion (as yet unnamed).

Designed for tracking down atomic particles, the new emulsion is about four times as "fast" as any made previously and has successfully recorded electron tracks ten times longer than have ever before been photographed. According to Dr. John Spence, who's in charge of research on the emulsion, it's characterized by a high concentration of silver halides with uniform sensitivity of all its tightly-packed grains, and "comes very close to complete recording of any nuclear particle."

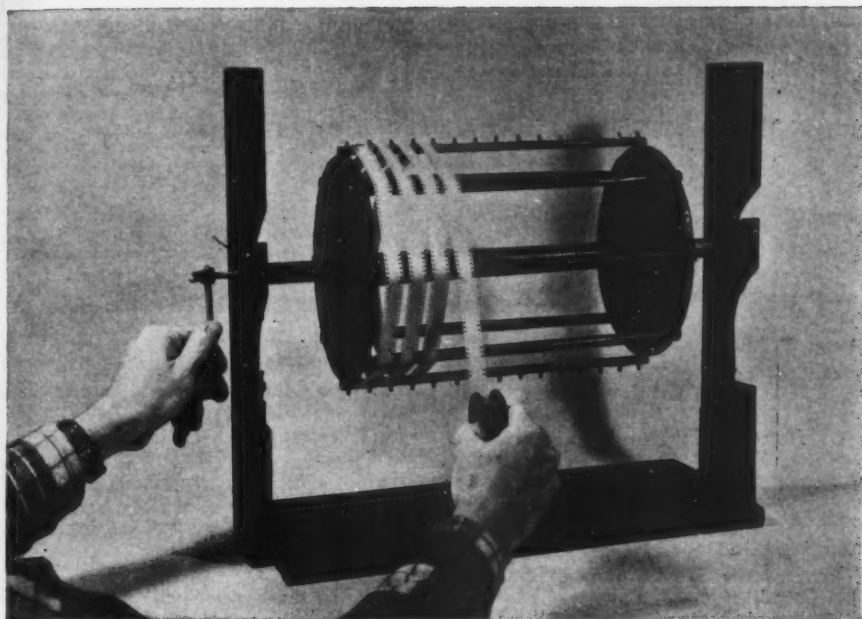
All this means a lot to nuclear phy-

sicists, who are as noseey about what goes on inside the atom as Hedda Hopper is about Hollywood.

Before Kodak's entrance into the picture, the closest scientists could hope to come to the individual particle was to hear it—an audible click on the Geiger-Müller Counter—or to see the trail it left as it passed through a Wilson Cloud Chamber—a gimmick that gives the electron a vapor trail much the same as the visible vapor trail left by an airplane flying too high to be seen itself. Now, with the new emulsion, atomic researchers can see what they're doing.

Here's the way it works as Dr. Spence explains it—like a "skipping stone" on the surface of a pond. "If you have a good, round disc-like stone and throw it with precision, the frequency of the skips increases toward the end of its path. . . .

(Continued on page 107)



Roll Your Own

Processing your movies at home will save you time and money. Here's how it's done—without fancy equipment.

BY GEORGE CARLSON

If you are an amateur movie maker who wants something different, try your hand at home processing of black and white films. You can buy 100 feet of double 8mm film from a reliable mail order house for about \$2.00 and process it for about 50 cents once you have the equipment. However, the money saved, compared to buying some standard 8mm films such as Eastman and Ansco which include free processing in the initial price of the film for \$9.95 plus tax per 100 feet, is probably less interesting than the personal satisfaction of doing your own film processing.

The easiest film for the beginner to work with is one of the ortho types which has a non-halation backing. This film is not sensitive to all colors, as panchro-

matic film is, and therefore can be safely handled and processed using a red safe light such as the Wratten Series 2 in the darkroom. A coating on the back of the film acts to prevent haze and glare (halation) especially in filming scenes including large areas of skies and white objects. The emulsion speed is usually from Weston 6 to 10 so that the average exposure for a group of people under a clear sun should be F:6.3 or F:5.6, while open landscapes require F:8. Exposure data and handling instructions usually come with purchased film.

These films come on spools ready for your camera or in bulk on 100 and 400 foot rolls. Film purchased in bulk, of

FIGURE 1. This loading rack and reel are for experimental purposes to enable you to get the knack of processing movie film without wasting materials. Processing is done in ordinary photo trays.

FIGURE 2. A simple tray for processing with drum-type developing reels. This tray was built of wood and linoleum, then painted with acid-proof paint—paraffin works just as well.

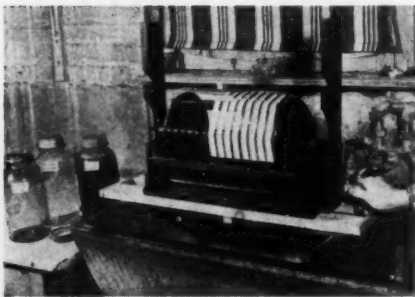
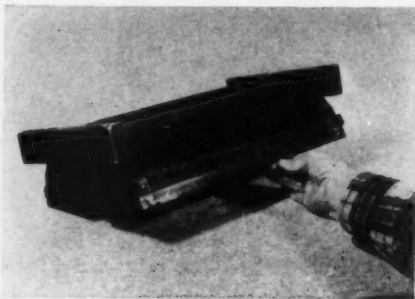


FIGURE 3 (above). Film wound on drum is being rotated slowly in first developer. Laundry tubs make an ideal work space because of the plentiful water supply and convenient drainage. Fig. 4 (right) shows auxiliary washing tray being used between solutions. Top position on loading rack keeps film out of the way while trays and solutions are changed.



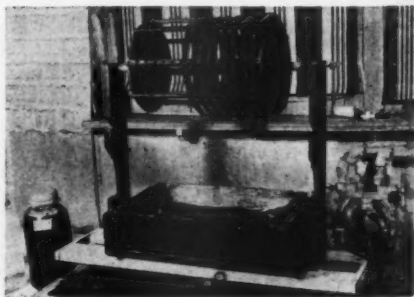
course, must be wound onto regular metal film spools for use in your camera in a darkroom with a ruby bulb as the sole source of light. All handling of the film up to a certain point (to be mentioned later) must be done by this red light.

Where To Buy Bulk Film

These films may be available at your local dealer or through advertisers in MINICAM PHOTOGRAPHY. Two sources are FROMADER GENERA Co., Davenport, Ia., and the SUPERIOR BULK FILM Co., 105 S. Wells St., Chicago, Ill.

As for the actual processing, if a regular darkroom is available to work in, that's fine. Otherwise it is a good idea to set up your working area over the basement washtubs as a lot of running water will be needed to take care of the several intermediate washings of the film during the different processing steps as well as the final wash. A couple of boards across the top of the tubs can be used to hold the processing stand and be your work table.

(Continued on page 115)



FIGURES 5 and 6. Construction details of developing reel (right) and drying reel (below). Film is secured to developing reel by a paper clip bent to fit end sprocket holes—a rubber band takes up slack as film expands. It's easier to wind film onto the drying reel if the film is kept taut. An elongated hole in end crossbar of reel allows dowel to be dropped after winding to release tension on drying film.

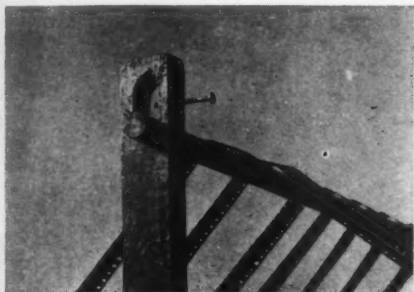
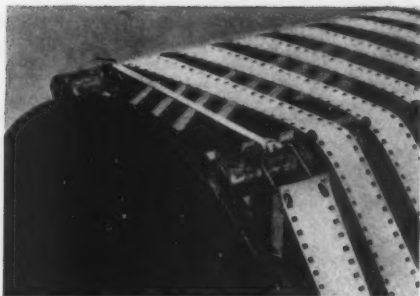
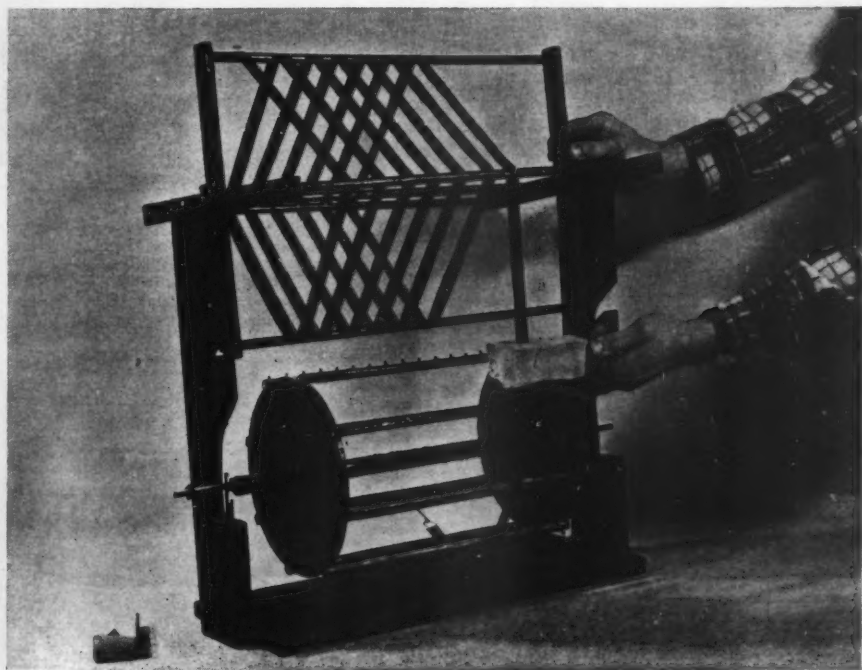


FIGURE 7. Completed film is wound onto another homemade reel for drying. A dampened viscose sponge helps remove excess water. The simple drying reel consists of four end cross-bars with $\frac{1}{4}$ -inch dowel sticks supporting the film coils.



BILLY BITZER

Hollywood's first ace cameraman

CINEMATOGRAPHY has come a long, long way in the fifty-odd years since the birth of the motion pictures. The "flickers" of yesteryear, although crude by modern standards, formed the basis of a great industry. Today's films, so technically perfect, so well acted, and so beautifully presented, owe much of their perfection to the early pioneers who made the first "galloping tintypes."

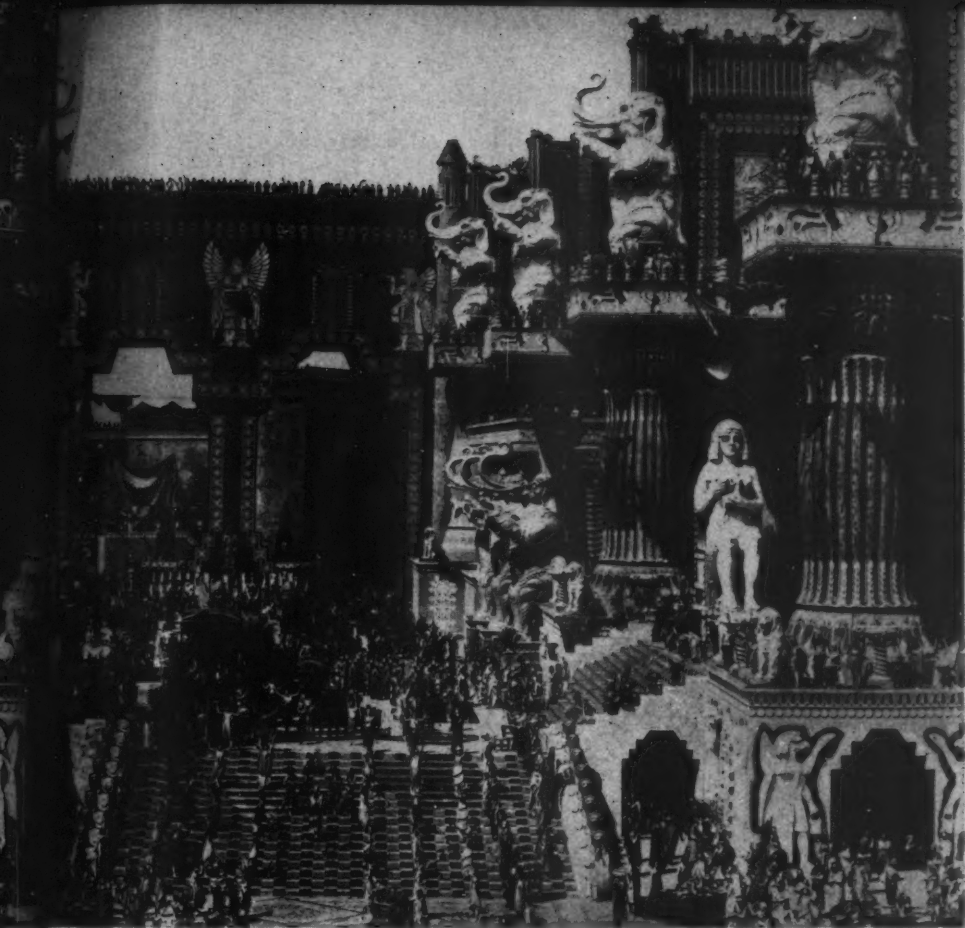
Among the many technicians whose talents are required if the varied worlds of fantasy, drama, comedy and music are to be captured on celluloid, the Director of Photography is perhaps the most important. It is his responsibility to turn a

How an electrician
with a camera,
and an unknown director
named Griffith, made
movies tell a story



BY
JOSEPH
MASCELLI





HOLLYWOOD still speaks with awe of "Intolerance," a D. W. Griffith picture that became the textbook for epic films. Telling four separate stories of prejudice through the ages, the original version required twenty hours projection time. At the left, D. W. Griffith is shown directing one of the scenes for "Intolerance" with Billy Bitzer at the camera. The Feast of Belshazzar, from the same picture (above), was one of the most lavish sets ever filmed. As many as 15,000 people appeared in some scenes. Photos: Museum Modern Art.

static script into visual motion and to translate everyone else's abstract ideas into images on film.

A master cinematographer is a rare combination of artist and technician. He deals in the highly exact sciences of optics, chemistry and light on one hand, while on the other he is involved with the artistic creation of fine compositions, mood, atmosphere, character and movement. The screen is his canvas; the action of light upon sensitive silver his

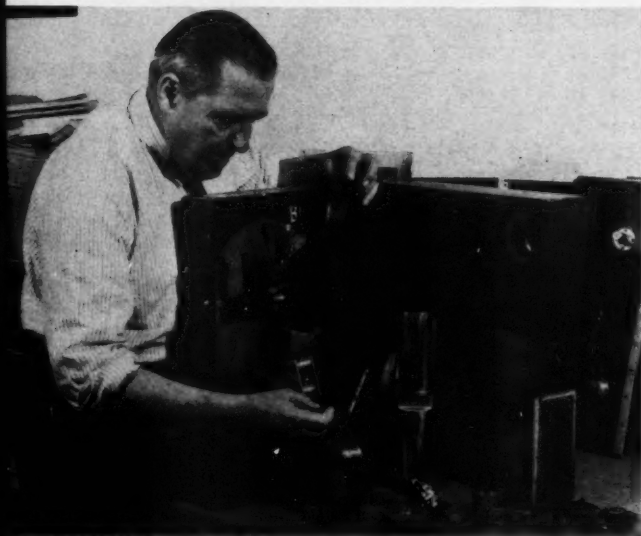
brush. Today there are many camera aces in Hollywood—men such as James Wong Howe, Bert Glennon, Archie Stout, Ruttenberg, Karl Freund, Joseph Valentine, Ray Renahan, and others.

But only fifty years ago—when the movies were young—there was no such thing as an *expert* cameraman. Anyone who had the price of a camera and could grind a crank an even two revolutions a second was not only a cameraman but a director and producer as well!

There was one man, however, who was destined to become the first master of the movie camera and who's work was to influence those who came after him for many years. He was Biograph's G. W. Bitzer, later to become affectionately known as "Billy" Bitzer and always spoken of in the same breath with D. W. Griffith as the founders of motion picture technique as we know it today. It was Griffith who taught the movies to tell a story. He gave the screen its syntax, developed its powers of suspense, excitement, drama and movement. It was Griffith's dramatic use of the flashback, the close-up, cross-cutting, extreme long shot, trucking shot and the last-minute rescue that first gave the screen the great story-telling potentialities we take for granted today.



A COLD, slushy set and a twosome (above) who made movie history, Billy Bitzer and D. W. Griffith. Below, Billy Bitzer reassembles an old Biograph camera used from 1908 to 1913 (Photo by Eliot Elisofen). Notice the sprocket holes in the film. Blanche Sweet, opposite, emotes for a scene in "The Lonedale Operator," filmed in 1911. Few "still" cameras were used on movie sets in those days. Most publicity shots were blowups from movie frames. *Photos: Museum Modern Art.*



Today we view "Flicker Flashbacks" and laugh hilariously. Surely an earlier age could not have taken these films seriously! They seem so crude—so badly acted and poorly filmed. Yet the industry is founded on these pictures and even today a few early epics stand up remarkably well. It is difficult to properly appreciate these early efforts unless we project ourselves backwards into time and glimpse the workings of a pioneer studio.

The modern amateur cameraman, with even the simplest camera and accessories, is vastly better equipped than the professional of those days. Today's advanced amateur's movie making would have made an old time cameraman green with envy! The first Biograph camera, the

Mutograph, actually punched the perforations in the side of the film as the scene was shot. The ray film was supplied unperforated by the manufacturer since the sprocket holes varied in different cameras. All pictures were shot outdoors—even "interiors," which were simply a wall or two or a painted backdrop. Studios made use of a revolving stage which rotated to follow the sun. The camera was locked down in one position so that it took in the entire scene. The view would be the same that a spectator at a play would see if he were seated in the middle of the house. There were no shifts in camera angle or distance. The camera was never panned since it took in the set completely and panning would



mean going past the set! An actor's prime requisite then was the ability to point. If a character could not point with emotion—then he was no actor. . . .

Movie cameras did not possess motors, an assortment of lenses on a turret or dissolving shutters. A cameraman could not rely on exposure meters, process backgrounds or optical printers for trick effects. Everything had to be done in the camera. If a dissolve was needed it was made by first fading out, while counting crank turns. Then, with the lens capped, rewinding, once again going forward and fading in. Finders were crude little keyholes that allowed the cameraman to peek through and focus feebly on the back of the film—this was before the advent of anti-halation backing. The camera's greatest worry was "static." In cold and dry weather the moving of the film through the gate would create static electricity which appeared on the negative as tiny lightning-like streaks resembling tree branches.



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TWO SCENES from "The Birth of a Nation," filmed in 1914. Billy Bitzer shot the picture with a Pathe camera, a clumsy wooden box with a crank in the back. He had two F:3.5 lenses and a wide-angle objective, but had never heard of such fancy gimmicks as turrets, exposure meters or light filters.

Photos: Museum Modern Art.

Every cameraman worthy of the name had his own "secret" remedy. Some placed a small alcohol lamp in the camera to create steam and so provide the necessary moisture. In cold weather the heat brought further trouble: condensation on the lens. Some used a metal brush that swept the film or they grounded the camera to the nearest radiator. In the winter the film was buried in the snow overnight so that it would be the same temperature as the camera. Difference in temperature sometimes caused the trouble. The worst thing about static was that the cameraman could not tell when he was getting it and only knew after the negative was developed. It was finally considered licked in 1915 when Eastman developed "X-back"

film with a resinous protective coating.

All film then had a habit of scratching very easily, but in spite of being slow and color blind the exposure did not differ greatly from today. The reason was that the developer was practically dynamite and developed a contrasty image that made the term "black and white" rather literal in meaning. The developing solutions in use then would develop modern fast pan emulsions by waving them back and forth over the tank. The fumes would be enough to do the work! Grain was ignored completely as a minor problem not deserving of consideration. There was no such thing as automatic machine processing—film was wrapped on a rack and dipped in large tanks of solutions. The "rack and tank" method was slow, to

BELOW, Mary Pickford and Marion Leonard in a scene from "The Lonely Villa," a Mack Sennett story directed by D. W. Griffith in 1909. Bitzer and Marvin did the shooting for Biograph on this

one. Lower right, Richard Barthelmess in a scene from "Broken Blossoms." Griffith was producing (as well as directing) his own pictures by 1919, but Bitzer was still his cameraman.

Photos: Museum Modern Art.



say the least, since only 200 feet of film could be racked at one time. In spite of all these limitations the *Biograph* pictures were outstanding in photographic quality for the time. Since their cameras could not be run in reverse, and were thus limited in trick work, Biograph made up for this deficiency by stressing story values and production quality. A physical handicap resulted in achieving a finer product.

G. W. Bitzer started with Biograph in 1896 as an electrician and worked at all types of odd jobs before he became exclusively a cameraman. He helped film the Jeffries-Sharkey fight in 1899 when the old Biograph company made film history by utilizing 400 arc lamps over the ring to

shoot the night contest on the slow film then available. The electrical connections were so badly overloaded that Bitzer had to raid the nearest saloon for ice to place on the sizzling plugging boxes and switches! The melting ice sent a steady trickle of hot rain down on the fighters to add to the gory misery.

Griffith joined Biograph in 1908 and Billy Bitzer was assigned to shoot his first directorial effort: *The Adventures of Dollie*. The early collaboration of Griffith and Bitzer is probably the best thing that happened to the early movies. They worked together perfectly — Griffith was the idea man and Bitzer furnished the technical knowledge necessary to realize

on film Griffith's many revolutionary innovations.

Although the movie industry was more than ten years old when Griffith started directing for Biograph, the films being produced were little better than the early "peep-show" films Edison first made for his Kinetoscope. Pictures, at the time, were still less than a reel and if made in two reels were released only a reel at a time. Many subjects were "split-reel"—two or more little episodes on one reel. Griffith, with his many ideas for lengthy subjects and new devices, had tough sledding at first because the powers-that-be frowned on anything radical. However, Biograph was in bad financial status and they were willing to try almost anything.

Movies were shot "off-the-cuff" or improvised on the spot to take advantage of a sudden snow-fall or some particular prop or location that was handy. The more elaborate productions may have been shot from an outline but such a thing as a shooting script was unheard of. There was rarely a second take—if anything went wrong the story was changed to fit the new development. This was a happy nonchalance that permitted both actors and technicians a free scope in their work. Stories consisted of a few related incidents pieced clumsily together to form a narrative.

Griffith realized that until films told a complete coherent story and developed character and motivation to logical conclusion, they could never progress beyond their crude beginning. But before he could do this he had to develop the story-telling technique of the movie medium. That is where Billy Bitzer came into the picture.

A characteristic of slow, unbacked film in those days was its distressing way of exaggerating highlights. The halation, or spreading of highlights, could be partially prevented by using a lens hood. Bitzer, while working in his cellar at home, made a make-shift hood from an old glue pot. He took it on location and used it successfully but when the processed film was projected he saw that the corners were cut off in darkness. He had forgotten the fact

that closing down his diaphragm had brought the end of the hood into view of his lens. Although Billy was disappointed, Griffith was wild with approval since he thought the effect very artistic which its subtle framing of the scene.

To be able to control the effect more easily and make the result more pronounced a large iris diaphragm from a still camera was added to the hood. A handle was used to control it. It was inevitable that one day the weight of the handle, added to vibration from the running camera, would cause it to close gradually and create the fade-out. Another technical failure, but once again Griffith realized the worth of the device. The final kiss climax of the films could now be given a dignified touch. As Bitzer so aptly put it: "We didn't have a five-cent movie anymore!"

Vignetting the corners of the frame and the fade-out were only the beginning. Bitzer later added gauze mattes to the front of his lens—simply a layer or two of chiffon with a cigarette hole burned in the center. Thus the corners would be soft and the center sharp. Later, graduated translucent celluloid was utilized along with special graduated filters. Also "barn-doors" which cut off the sides of the picture, so as to change the rectangular proportions of the frame, were used. Bitzer's camera became notorious and rival cameramen sent spies, in the guise of extras or bit players, to Biograph to give them detailed descriptions of his latest devices. Billy had to resort to covering his camera

(Continued on page 108)

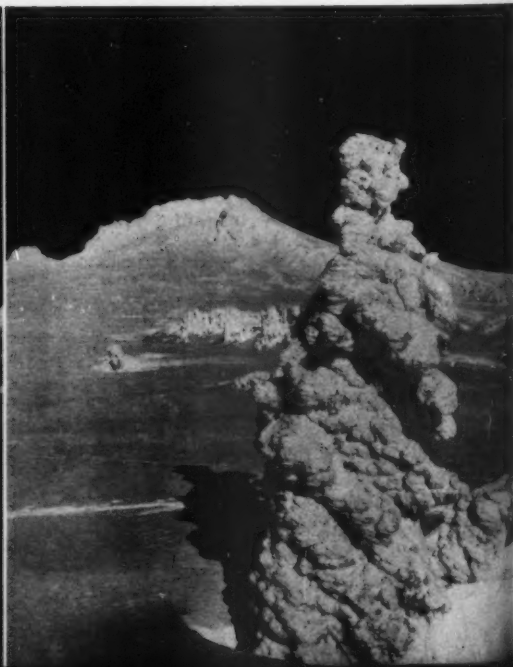




LEFT. Swaying to the chant of the winds, these are the trolls that guard the approach to the mountain top. Below: With swirling skirt the Queen of the Snow strides boldly among her subjects while a gargoyle looks broodingly into the valley. On the opposite page are gnomes and pixies dancing about to conjure up a magic spell.

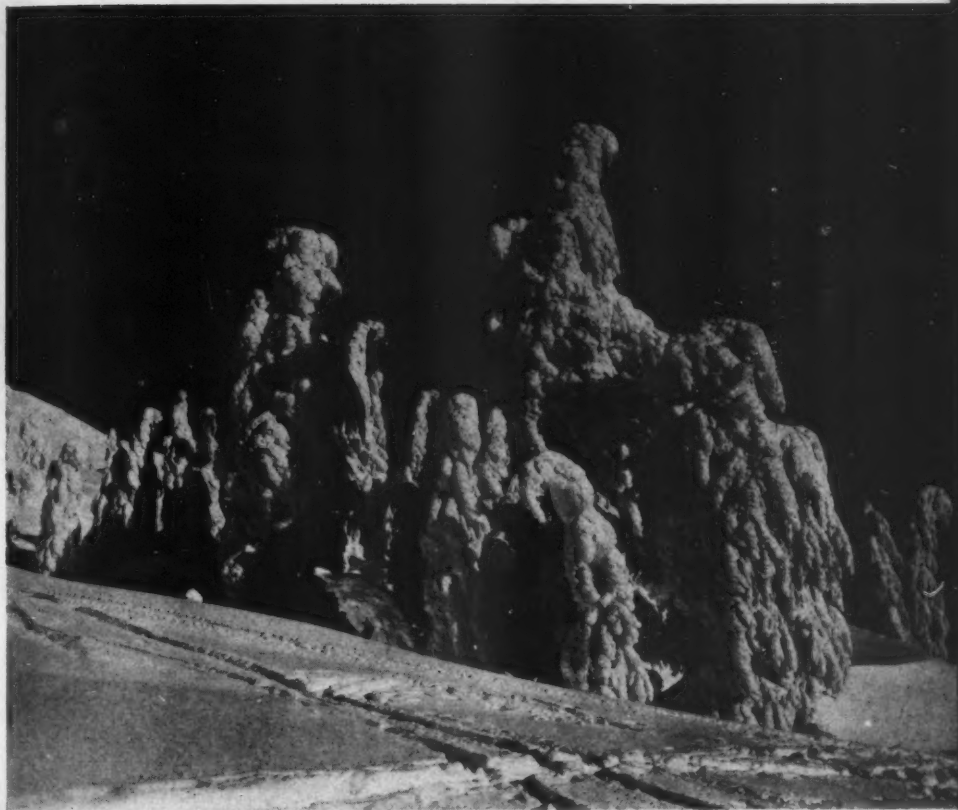
fantastic fairyland

Hugh Ackroyd photographed these pixies on Mt. Hood. If you look sharp for these icy folk after the next heavy sleet or snow they may pose for you, too.



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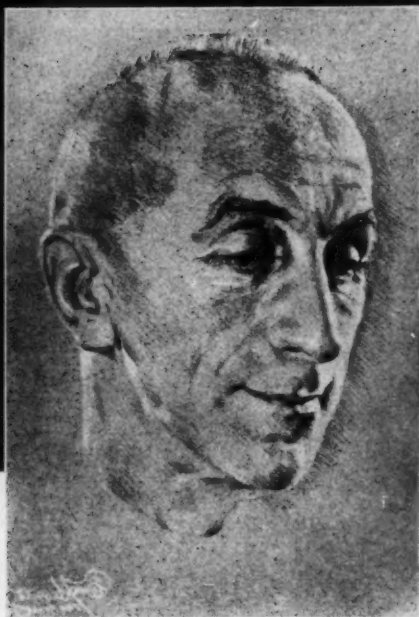


"I LEFT PORTLAND, Oregon, just as the sun was beginning to show over the horizon on the first day of March," says Hugh Ackroyd. "In my garden there were tulips still closed from their night's sleep. There had been a storm on Mt. Hood the night before and I was anxious to get up to Timberline Lodge while the snow was still crisp and sparkling.

"At Government Camp I stopped to put on my chains. The sign said direly, 'Motorists are warned to put on chains here.' It wasn't a bad idea for the snow walls of the road looked about eight feet high.

"As I approached the Lodge my shutter

finger began to tickle. On every side of me were spruces and firs bent and hanging over in all manner of fantastic shapes. The mist that had shrouded Mount Hood in the early morning had glazed and weighted down the trees. Here were frozen Valkyrie with icy flowers dancing about them. There were gargoyles peering over snowy cathedral ledges. My day was to have been spent in skiing but instead I was so intrigued that I spent it in picturing this fantastic fairyland. Just for the record, most of the shots were made at F:16 to F:22, 1/100th second, using a light yellow filter".



SELF PORTRAIT

KASSOWITZ and the LEICA

By McKinney and Linse

WHEN A CUSTOMER enters the Seattle, Washington, studio of Ernst Kassowitz, his first impression is that of informality. Like as not he is greeted with an old-fashioned continental handshake by Kassowitz, and with a warm smile by the photographer's wife, Roberta. But after noting the usual lights and settee, the customer is apt to be puzzled when he looks for the studio camera.

There is no studio camera. And thereby hangs a tale.

Ernst Kassowitz, a native of Austria, carries his portrait camera in his pocket. It is a 35mm Leica camera with a long focal length lens and Kassowitz's use of it for portrait work is in keeping with an honorable tradition of the Old World. Like Dr. Paul Wolff and other outstanding photographers who use the 35mm camera exclusively, Ernst Kassowitz has never felt the need to switch to a larger camera. He makes as many as twenty or thirty shots at a sitting in quick succession, using the mobility and easy handling of the Leica

as an interpretative tool for obtaining a variety of poses and moods. And with a Leitz enlarger he produces 11"x14" prints rivaling the quality of those usually produced from negatives many sizes larger.

Kassowitz's first photographic attempts, made at the age of fourteen with a camera closely resembling a Kodak Brownie, were records of his frequent trips through the French, Swiss, and Austrian Alps. Then, as he gradually became interested in portraying the workaday world about him, his pictures began to appear in various German publications. In 1929 he invested in his first Leica and a Leitz enlarger, and these were the pieces of equipment he brought with him to America in 1935.

Kassowitz had several reasons for coming to this country to complete his photographic career. First there were high license fees and long (six or seven years) apprenticeships required in Austria before one could open his own studio. Moreover, in several European magazines he had seen prints by Dr. Max Thorek and other out-



PHOEBE PALLETT at 2½ years. This picture was made in the studio using 90mm lens and is representative of hundreds of photographs made of this little girl who is one of Kassowitz' favorite sitters.



JEAN BROWN—composite made from two negatives

standing American photographers which, to him, represented an enviable freedom of expression enjoyed here by photographers. Finally, he had a brother and sister already living in this country who greatly influenced his decision to migrate.

In a sense, Ernst Kassowitz might be called the "Athletic Photographer." Thin-lipped, intense, and quick on his feet, he works rapidly, flitting from lights to sitter and back again so quickly that his actions seem to divert the subject's atten-

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DON BUSHNELL—conductor of the Seattle Philharmonic

tion. When the spectacle of a man hard at work ceases to intrigue the subject, Kassowitz sometimes turns the lights off and pretends that the sitting is at an end. As soon as the customer relaxes, the lights are on again and the session resumes.

When asked about the "secrets" of his success, Kassowitz merely smiles. "Secrets? I have none. How do I control the problem of grain in such tiny negatives? Why, by following the manufacturer's instructions. Is there a better way?"

Actually, there is something more to it than that. Kassowitz is a meticulous worker. He controls his exposure and developing techniques with exacting care, and fights dust—the bane of all 35mm users—with the relentlessness of a Dutch house wife.

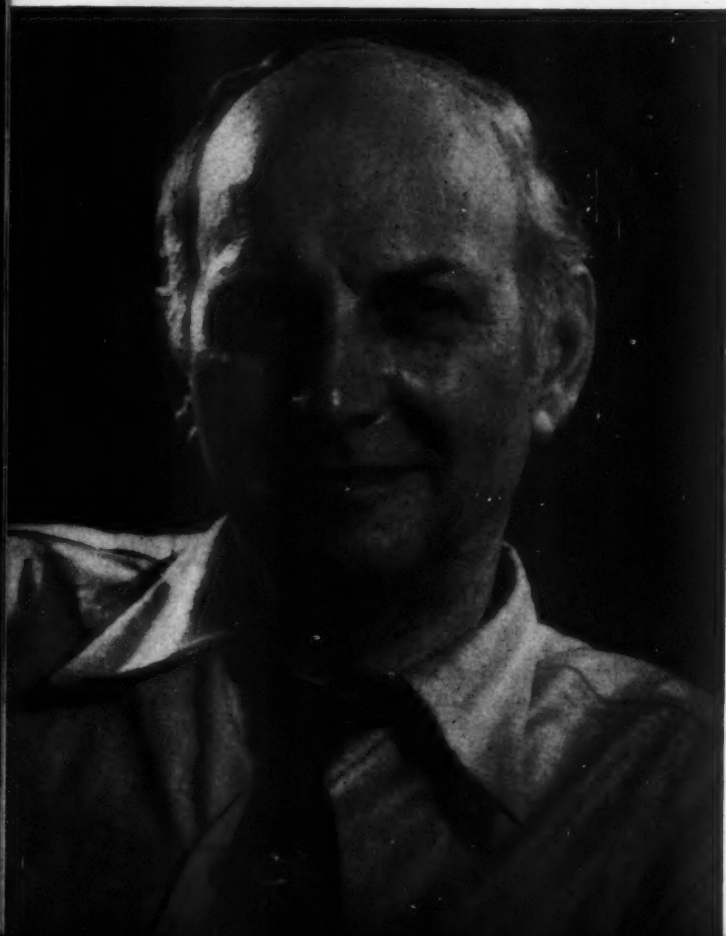
For the past three years he has been using Ansco Finex full strength for all film developing. To this he adds packaged replenisher as needed and develops 15 to 17 minutes, depending upon the temperature. For the most part he prefers to develop negatives for 15 minutes at 70 degrees. Since his lighting for a picture is quite contrasty, he makes it a point to give plenty of exposure in order to make certain of lots of detail in the shadow areas. The result is uniformly exposed and de-

veloped negatives with which various grades of printing paper are used to achieve the specific effects he desires. Oftentimes he makes a dozen prints before he obtains one to his liking, but notes are made of each exposure so that later, knowing the grade of paper used, he can duplicate the final shot at any time.

Eastman's Opal H, Kassowitz finds, is one of the papers best suited to his portrait needs because it has a fine grained matte surface with just enough tooth to take kindly to the pencil and etching knife.

Roberta Kassowitz does the exacting work on Ernst's prints. She uses fine pumice and an etching knife to reduce dark areas, and tones down light areas by

(Continued on page 120)



JEFF DAVIS, King of Hoboes, came to get Ernst to join his club and ended up by having his picture taken.



AT THE TIME of taking, this young lady was a patient at the Children's Orthopaedic Hospital.



TEXT: DON STORING

PUPS have PERSONALITY

All pets are photogenic, but if you capture something of your pup's character on film you'll have a picture that sings.

KIDS AND PUPS are sure-fire subject material whether you shoot for money or the family album. The boy, above, has a grip on the pups that solves the problem of keeping them together long enough for a picture. When pups are "on their own," half

the fun in photographing them is in not knowing exactly what will happen. The fellow on the left (below) is obviously thinking about lunch, the lad in the middle is siesta-minded, but his sister is determined she will supervise all picture-making.



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PHOTOS: WILLIAM WHITAKER

AFTER THREE YEARS of study, a group of scientists in Bar Harbor, Maine, recently correlated their charts and graphs and solemnly announced that every pup has a personality of his own.

Photographers, of course, have known this (intuitively) for years. Even so, it has not always been easy to capture the ill-siveness of their pet's character on film.

It's easier on both you and the pup if you can shoot with flash, because flash permits shutter speeds of 1/200 sec. or faster. But with photofloods and a little patience, the results can be very creditable. Remember that working under the hot lights has a tendency to make all pets sleepy, restless, or both. So, when possible,

(Continued on page 106)



PROPS can help give pet pictures an appealing twist. Notice how the prop in the picture above is carefully positioned to give the pup subject dominance by means of contrast. Below, a different kind of prop is used to help give the picture a warm story-telling appeal. Photofloods are fine for a picture like this because heat makes a pet drowsy.



magic of magnification

BY VICTOR BALDWIN

LET'S MAKE some close-ups. Not close-ups in the sense of the large head-size images you get when you focus a miniature camera lens at a subject from a distance of three feet. I mean *real* close-ups—pictures of objects only 14 inches, or 10, or 6 or even 3 inches in front of the lens!

Don't let it worry you if you don't happen to own a microscope. The technical title for making pictures which involve the use of a microscope is *photomicrography*. Some day you may want to go into that, but right now let's stick to *photomacrography*—which is the trick of making little objects look big through the use of photography. If you have a 35mm camera with a removable lens and either a focal plane or a between-the-lens shutter, you can get into this field with as little as \$45.00 spent for additional equipment.

Before we discuss the kind of accessories needed or the technique of making photo-

macrographs, let's talk about what close-up photographs are good for. First of all, of course, the novelty of a king-size portrait of your wife's eye is likely to amuse you. Beyond that you will find that macro-photography is a source of amusement, photographically speaking, in hundreds of ways. You will be taking pictures like those in the Game Section of the *Ford Times*, published monthly by the Ford Motor Co., but being your own boss, you won't confine your close-ups to automobile parts. Close-up sections of everyday things used and seen about the home or office take on a mystifying appearance when the camera lens is poked right up on top of it, and it will surprise you how few of your friends will recognize them. A close-up shot of the head end of a book of safety matches, for instance, or the bristles of a hand scrubbing brush, or the end of a run in a woman's stocking are

THESE are the basic essentials of equipment required for making accurate close-up photographs. The equipment includes a minimum of two lens extension tubes, a cable release, a 35mm camera with either focal plane or between-the-lens shutter, and a Speed-O-Copy or similar ground glass closeup attachment. Approx. cost, excluding camera, \$45.



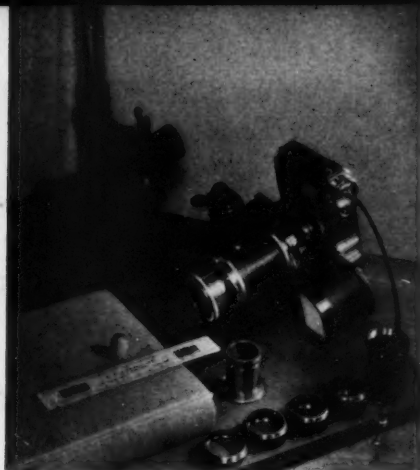
viewpoints of common things which we are unused to encountering and excite wonder as well as new pleasure in our hobby.

But after the novelty of obtaining unusual viewpoints of ordinary objects wears off, what then? Then you begin to see the useful, serious side of photomacrography and its important functions in the professional fields. While you may never want to enter these fields yourself, it is quite possible that you can find a way—if you so desire—to make money on the side with your photomacro hobby. We can't, in this article, suggest all the pin-money possibilities in photomacrographing flowers, insect collections, stamp collections, and the like, but later on we will consider some of the clinical, industrial, and laboratory outlets for photographs taken close-up.

Like most hobbies one can go as deep into the pursuit of close-up pictures as time and money permits. The beginner who wants to feel his way into close-ups gingerly and with a minimum of expenditure can do moderate close-up work with equipment costing under \$45.00, exclusive of his present camera. He can later equip himself to handle extreme close work at a cost of from \$95.00 to \$120.00, depending on his make of camera and the area of coverage to which he expects to converge.



A MODERATE amount of equipment which facilitates making close-up photographs is shown above, right. Included in this set-up are a base board, an upright, sliding arm, Speed-O-Copy (or similar ground glass close-up attachment), cable release, and three extension tubes. ELABORATE equipment, below, contains all the devices mentioned above plus a swivel arm for taking horizontal close-ups, a tube for the swivel arm, a total of six lenses, extension tubes, and a critical focusing magnifier. The approximate cost of the moderate and elaborate set-ups is between \$95 and \$125, depending upon the camera used and the necessary adapters, and extension tubes. (Price is exclusive of camera)



CONTAX camera with Speed-O-Copy attachment and combination of lens extension tubes used to photograph a thimble (below) from a distance of three inches. The extra tubes were used in making the photo on the opposite page. The magnifier is the object between the extra tubes and the ruler.



Oddly enough, the cost is in an inverse ratio to the area; the smaller the area, the more extension required.

By means of lens tube extensions which are threaded at both ends, one end to accommodate the lens, the other to screw into your camera, you get the effect of an increase in the focal length of your lens. These lens tubes may then be used in conjunction with one of the several ground glass attachments on the market today which afford critical focusing and composition of your picture before you shoot. The Leica slide copying attachment, for example, sells for \$45.88. Other makers of copying equipment for 35mm cameras are the Bolsey Corp. of America, 118 E. 25th St., New York; Universal Camera Co., 28 W. 23rd St., New York, and C. B. S. Lahs, 561 Crescent Ave., Buffalo, N. Y.

The most versatile of these ground glass accessories (versatile in that it may be used with any of the 35mm cameras in which the lens can be removed, with but minor differences in the adapters necessary for the various lens and tube combinations) is one which is interposed between the camera and taking lens, the entire unit then mounted on a sliding arm which may be raised or lowered on the vertical upright of a baseboard. For focusing, the camera is hinged back out of the way, and the ground glass hinged into position behind the lens.

As the distance from the lens to the ground glass is the same distance as that from the lens to the film when the camera is hinged into shooting position, anything that appears sharp on the ground glass is automatically in sharp focus when the shot is made. Though composition is a matter of relative ease on the small ground glass, critical focus is facilitated by a 7X magnifier made to fit over the glass of this particular make of close-up attachment. Other makes of apparatus do competent jobs but possibly with less facility and speed of adaptability to a wide combination of various cameras and lenses.

There are several general practices common in normal photography which apply particularly to close work, and which affect materially the results achieved. As

a tripod improves the quality of work done over that which is hand-held (and hand-held photomacrography is definitely *not* recommended), so too a rock-steady base is absolutely essential where great or even moderate magnification occur. Not only the picture area is magnified but so is the vibration. The slamming of a door or the careless tread of a person passing through the same room will cause a loss of definition and clarity. For this reason a cable release is a must, and the longer, the better. Of course the miniature camera lens and its short focal length may be shot wide open under ordinary conditions and effect a comparatively broad depth of field (that distance from the nearest point sharp to the farthest point sharp) but in close-up work, except where a person is reproducing a flat field, such as the minute printing in a miniature Bible or fine engraving, the field falls off quickly in proportion to the proximity of the lens to the subject. Therefore, stopping all the way down on the diaphragm is a requirement to acceptable enlargements from close-up negatives.

Where the close-up shooting of a curved or rounded surface occurs, the final result must be sharp from border to border on your print or the whole effect is lost. Another technical requirement in close-up photography to keep in mind is exposure. Sometimes with extreme lens extension, the exposure factors may go as high as 50 times the indicated exposure. Accurate meter readings must be made so that you can compensate for the lens extension, because light intensity falls off as the square of the distance from the source. It is recommended that the subject be lighted while viewing from a line on the axis of where the lens will be shooting, which will allow meter readings to be made before the camera is placed for exposure.

Perhaps the quickest and easiest alternate method of determining effective aperture with extension tubes or extended bellows is that of using the *Effective Aperture Kodaguide*. This pocket-size guide is ex-



SAME SETUP shown on opposite page being used to photograph thimble (below) from distance of two inches. A total of 196mm of lens extension tubes is being used with the Contax camera for this photo. Exposure factor is about 50 times normal. Panatomic X film, dev. in Microdol 18 min.





Photo E. Leitz, Inc.

FOCASLIDE setup for making close-ups with flash.

POLICE EXPERT, below, making a close-up photo of a test wood-turning made with a bit taken from a confiscated kit of burglar tools. Strong side lighting is being used to reveal texture and the marks of the bit in the wood. At the right (below) is the final picture of the wood-turning with a scale to indicate size. Comparison shots of small objects made by close-up photography often supply irrevocable proof of guilt or innocence in court cases.



cellent for use in modifying exposures for subjects closer than eight times the focal length of the camera lens being used. You can obtain a *Kodaguide* from most photo supply dealers for 15c.

The economy of miniature film is a factor which may be exploited in close-ups. The care needed in setting up, lighting, determining exposures, focussing and otherwise preparing for the shot, takes enough time so that one can insure oneself against having to duplicate the setup in the event of a miscalculation, by taking at least three exposures on each setup; one right on the nose, one a full stop over and another a full stop under the indicated, or rather, calculated exposure. This gives a latitude for error and provides a safe variety of printing densities.

While the manufacturer supplies accurate lists of the areas covered by the lens and tube combinations, a few figures here will acquaint you with the possibilities. For instance the Argus "21" with the 50mm Cintar lens and a minus 3 auxiliary lens will, when used in conjunction with a Speed-O-Copy, take a picture of an area 12x18 inches with the lens at a distance of 28¾ inches from the subject, and requires a 1.2 exposure factor. This same camera



and lens using extension tubes of $\frac{3}{16}$, $\frac{1}{8}$, and $1\frac{1}{2}$ inches in combination will cover an area of $1\frac{1}{2} \times \frac{7}{8}$ inches with the lens at 2 $\frac{1}{2}$ inches from the subject and requires a 7.5 exposure factor. Other combinations in between these extremes will cover approximately all in-between areas. Likewise the Contax mounted on the Speed-O-Copy and the F2 lens will cover all areas between $4\frac{1}{16} \times 7\frac{1}{16}$ using the lens only with it 12 $\frac{1}{2}$ inches from the subject, down the scale to $\frac{3}{16} \times 1\frac{1}{4}$ using lens adapter, 7, 12, 15, 22, 30, 45, 60 and 90mm tubes in combination, with the lens 2 $\frac{1}{4}$ inches from the subject and using an exposure factor of 54.

For those who do not own cameras of the type described above, there is a method by which any camera can be converted for making extreme closeups through the use of an accessory called a portra lens. A pamphlet describing this method and giving specific data on the size of field is entitled: "Portra Lenses and a Technique for Extreme Closeups." It is offered free to all picture-makers by Eastman Kodak Sales Division, Rochester 4, New York.

The pictures accompanying this article barely suggest the field of possibilities inherent in the use of a miniature camera and close-up attachments. We mentioned awhile ago that aside from money-making ideas you may hit upon yourself, you might someday be interested in the clinical and laboratory uses of macro-photography.

In Los Angeles, not long ago, a burglar used a brace and bit and a jimmy to force entry into a store through the roof. Police investigators at the scene gathered up wood turnings from the drill and photographed them in the Crime Laboratory, using a close-up camera and strong cross lighting to reveal texture and tool marks. Several weeks later, the uneasy demeanor of a man stopped for questioning on a minor traffic violation led to a more thorough examination of his person as well as his car.

A complete kit of burglar's tools in the trunk compartment of the car heightened the arresting officer's suspicions. A little

later, reference to the unsolved burglary files centered the investigating officer's interest in the wood drill that had been found in the tool kit. After drilling a test hole in a plank with the same bit, the investigators placed the turnings under a close-up camera and photographed them with the same strong cross-lighting that had previously been used on the turning found at the scene of the crime.

No time was wasted by the jury having to deliberate in this case. The investigators showed the jury not only photographs of the original evidence and the matching test-sample made in the laboratory, but also a close-up photo of the drill itself which clearly showed the irregularities on the cutting edges that accounted for the



HOSPITALS, research laboratories, and many manufacturers use close-up photography extensively for recording purposes. Lloyd Matlovsky, chief photographer at the Los Angeles County Hospital is shown preparing a human heart for a close-up photograph five minutes after it was removed from a body undergoing autopsy. This photo will later be used as an aid in training medical students.

incriminating marks left on the wood. There could be no rebuttal to photographic evidence that nailed down the facts as securely as this.

Close-ups are often employed in the prosecution of hit and run traffic violations. Flesh or blood, bits of hair, or fibres of clothing fabrics may be embedded in the paint on a dented fender and photographic proof of this evidence, later associated with the victim, assists the police in prosecution of such a case. When the run-away car is located in a repair shop through warning bulletins issued to proprietors of all such businesses, the close-up camera virtually becomes a "truth serum" in cracking the case.

Today primary elementary diagnosis is studied by medical novices through the medium of close-up photographs, both in black and white and color. A simple example of this is what every visitor to a doctor's office has experienced. Everyone recalls hearing the words, "stick out your tongue. Now say 'ah-h-h'." Did you ever stop to think what the doctor might be looking for, or that what he saw might indicate something to him about your con-

dition? In many vitamin deficiencies the tongue will show a condition which a doctor can readily translate into a prescription to balance a specific deficiency. For teaching purposes can you imagine how a doctor would describe these symptoms accurately enough to a student to enable him to recognize them the first time he encountered them in practice? In the description of such complications as leucoplakia, or the appearance of white spots on the tongue, the teaching doctor would, without photographs of such a case have to resort to the sketching or drawing of such symptoms, and doctors are usually no more skilled at drawing than the average photographer, insurance salesman or carpenter.

Conditions similar to these in medicine prevail in the fields of heavy industry, science, commerce, and manufacturing. Close-up photography in these fields is a tool but whether you, as an amateur, use photomacrography as a tool or a recreation, one thing is certain. An exciting, diminutive new world lies at your fingertips and it is within your power to explore that world through the magic of magnification.

THE SPACE-SAVING advantages of close-up photography are already well known in many libraries and business offices where a handful of film rolls have replaced dozens of bulky file drawers. Shown below is an 800 page telephone directory and the rolls of film required to photograph the entire volume.

Photo E. Leitz, Inc.



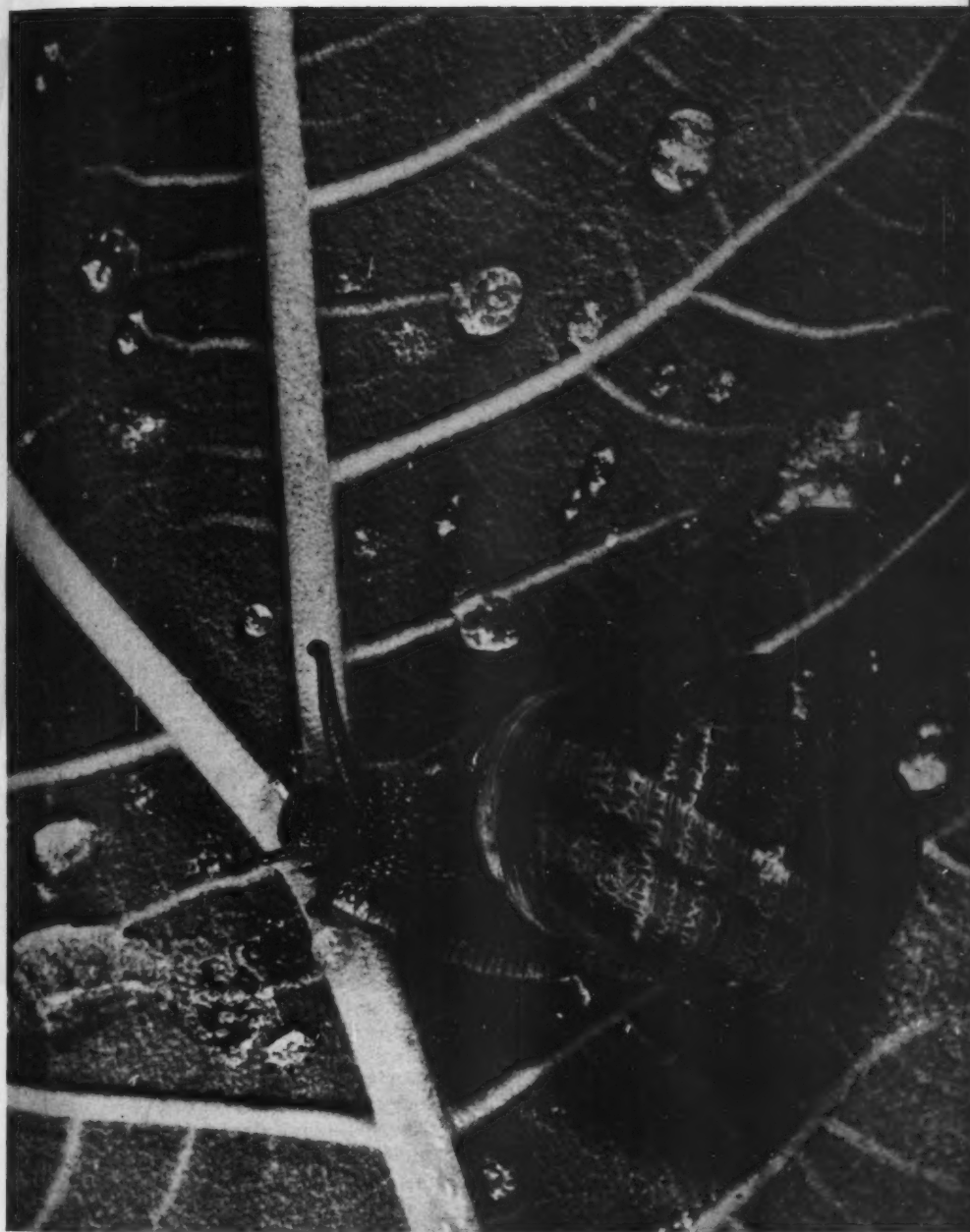


Photo Irving Sherlock

MAKING big pictures of little objects purely for the fun of it has attracted hundreds of amateurs to the art of photomacrography. With a whole new world of subject matter a couple of inches in front of his lens, any bright lad with a camera can make photographic pin-money shooting close-ups of stamps, insects, or the minature hobby collections of his friends.

Candid in the dark

HOW TO SHOOT PICTURES WITH INVISIBLE LIGHT



By JIMMY KYLE

"YUH'RE a no-good rattlesnake, McGurk. Yuh're not gonna get away with what yuh're doin'!" Over the hill bounds the posse, guns blazing. McGurk bites the dust, the rancher's lovely daughter is rescued, and Wild William croons a tune to his horse. The good old horse opera is in full swing.

What a wealth of pictures exist in that audience for the candid camera fan. Small boys, eagerly watching the screen.

Rapt attention as the Indians attack the stagecoach. Disgust during love scenes. The Saturday afternoon Western-show audience never watches a scene passively; this audience *lives* it.

But since the light in a theatre is too dim for pictures without flash, and since the first regular flash bulb you pop in a theatre will promptly bring a none-too-gentle response from the head usher, there is only one remedy. Fortunately it is a

IF SIX-GUN-SID misses that outlaw, Johnny will nail him from front row center. Infrared film and invisible light were used to make the picture on the opposite page. The kids didn't know they were being photographed. Ralph Crane from *Black Star*.

rather simple remedy—infrared flash.

Infrared flash is a technique that was developed by British news photographers during the war, so they could take pictures during the blackouts. For this reason it is usually called "blackout" flash. The process is all but forgotten now, yet it is as simple as any other kind of flash photography. All you need is a camera, some infrared film, and a few blackout bulbs.

To put it briefly, infrared flash uses invisible light to take pictures by. The human eye cannot see infrared light. However, certain special kinds of film can. When these special films are used with a special flashbulb—one coated with a dye that filters out all light but infrared—a picture can be made without any visible light. The special infrared-sensitive film *must* be used. The process will not give any results if ordinary film is used.

The dye-coated flashbulbs are hard to get at the present time, since few camera stores have enough demand for them to stock them. They are obtainable on special order, in the 22R size at 34c and in the 5R size at 23c. These prices are for single-bulb lots.

If the bulbs are available in your locality it will be a little easier for you to start shooting blackout pictures. However, don't give up the idea just because the bulbs may not be obtainable in your nearest camera shop. It is really easy to coat any flashbulb with a combination of dyes that filters out all visible light except a small amount of deep red. The following formula from the *Photo-Lab Index*, is reprinted by permission of Morgan and Lester, copyright owners.

Blackout Coating for Flashbulbs

Eosin 2524	4 grams
Tartrazine N.250	6 grams
Coomassie Violet RS	4 grams
Lissamine Green	10 grams
Hard Gelatine	200 grams

Glycerine	100 c.c.
Water to make	1 liter

This is a British formula, and the dyes are unobtainable in the U.S. Suitable dyes, which may be substituted directly in the formula, however, are obtainable from DuPont, and from the Allied Chemical and Dye Corporation's National Aniline Division. A list of the dyes, prices, and

(Continued on page 112)



ABOVE: If you are unable to buy infra-red bulbs, you can coat clear bulbs yourself. Each dye is dissolved in a separate container and gelatine is added before mixing them. Below: The bulbs should be dipped into the coating mixture until the sun can barely be seen through them. Then they should dry about twenty-four hours before being used.



Multiple Exposure Simplified

BY EVA MARSH

MULTIPLE EXPOSURES, or intentional exposure of the same negative to several images, are photographic hors d'oeuvres. The appetizing thing about them is that they provide a foil against which you can let your imagination run riot. If you have ever made an accidental double exposure, you already know the camera technique involved. You simply click the shutter more than once without

advancing the film between exposures.

For best results with intentional multiple exposures you will need some sort of plain black background and one or two lighting units. Spotlights are ideal for this purpose because their beams can be controlled, but photofloods will do if you can keep them from illuminating portions of the picture that should remain dark.

Without light being reflected from an

NOT TWINS—merely the same girl photographed twice without advancing the film between exposures. After the first exposure (left) the girl changed position. The picture would have been better if, in the righthand image, the eyes had been directed towards those in the lefthand image.

Photo: George Boardman





THE TRICK in combining tabletop setups with live models by multiple exposure is to keep the illumination the same, and various images in the right proportion. For each of the pictures on this page, the first step was to shoot the tabletop "prop" against a black background. Then the prop was removed and a second exposure was made on the same negative—this time of a live model properly posed against a black background. Lighting details are fully explained in the accompanying text. *Photos: George Boardman*



object, no image can be registered on film. Thus if you photograph a subject against a black background, but keep the light from reaching the background, the only image that will appear on your negative will be that of the subject. The rest of the negative will be blank and you can go on registering additional images in the empty areas not yet affected by illumination.

Cameras with ground glass focusing backs, or reflex cameras of either the single or twin lens types, are the easiest to use for deliberate double exposures. Successful pictures can be made using other types of view finders, however, providing there is some means of tracing the images in each shot so that subsequent images (for later shots) do not overlap the first.

With the subject posed against a black background and the light adjusted so that *only the subject* receives illumination, trace the outline of the subject on the viewing device on your camera. If you are composing on a ground glass, the outlines can be drawn on it with a crayon or anything else that will rub off easily. After the subject has been outlined, make an exposure but do not advance the film afterwards. Instead, move either the subject or the camera (or both) until another image can be registered on a portion of the negative not yet exposed. The first outline is your guide in this. Simply avoid having the second image overlap the outline drawing of the first as shown on the ground glass. You can either stop with two exposures — or keep on making exposures as long as your outline drawings indicate available space on the negative. It is best to keep the exposure time and diaphragm openings the same for each of a series of exposures on the same negative. This makes it possible for the negative to receive normal developing and printing procedures. If exposures and diaphragm openings vary from image to image, printing difficulty due to over and under exposure is likely to follow.

Whenever the lights must be moved between exposures, special care should

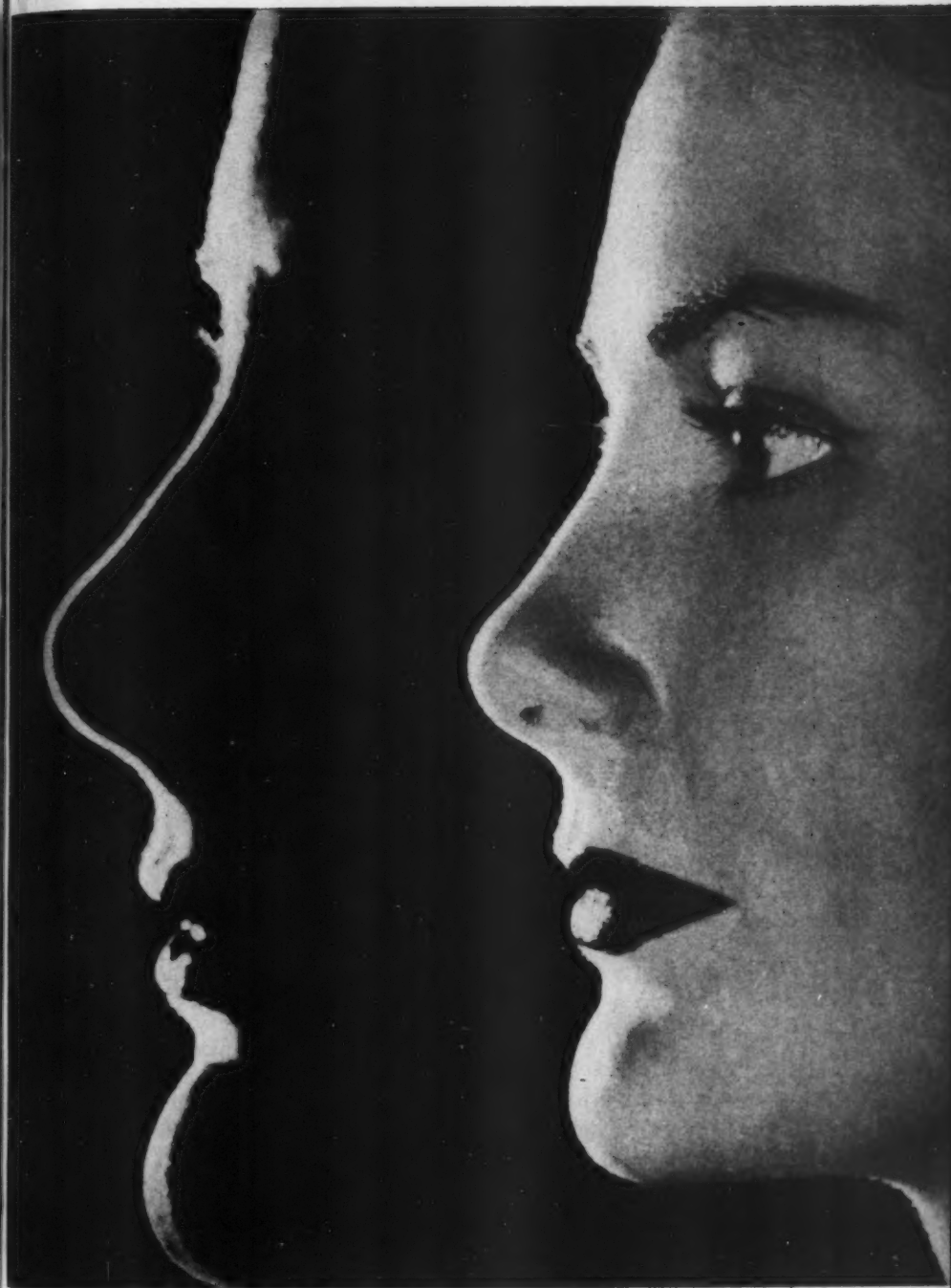
be taken to make certain that all images appear to receive illumination from the same general direction. In shooting the picture of the girl riding the horse, for instance, the china horse was dealt with first. This had to be a close-up because the horse was only six inches tall. After the animal's mane and back had been traced on the ground glass, the position of the light was carefully noted and an exposure was made.

Next the horse was removed and a girl was posed on a bench covered with dull black cloth. In order to obtain a relatively small image of the girl for the sake of proper proportions, the camera was moved back about 10 feet. Using the ground glass tracing of the horse as a guide, the camera was adjusted so that the girl appeared to be resting on the horse's back. Finally a single spotlight was placed in the same relative position it had previously occupied for illuminating the horse, and the exposure was made.

To combine a full face profile with a rim-lighted profile requires much the same technique. The white-edged silhouette is photographed first with the subject seated in front of a black background. A single light in back and slightly to one side of the subject (far enough to the side to be out of camera range) provides all the illumination. After the silhouette has been traced on the ground glass, an exposure is made. Then either the subject or the camera is shifted so that a separate image can be made on the second exposure.

The second exposure is made with the subject lighted the same as for any ordinary picture—with special care taken to see that none of the light spills over on the background itself. After the second exposure has been made (or additional exposures if you are in an experimental mood) normal development and normal printing are the finishing touches.

DOUBLE-EXPOSURE using a rim-lighted profile to repeat a "straight" profile exposure. By Bob Kohl.



amateurs have all the fun . . .



By WILL LANE

"WHAT an easy life," said the amateur photographer to the magazine lensman. "Nothing to do but take pictures of stars like Ginger Rogers, Teresa Wright, Gale Storm, and Ann Miller."

Earl Theisen, LOOK's Hollywood photographer, and MINICAM contributing editor, was hopping from rock to rock in the Rogue River, Oregon, Rollei in hand, while La Miller was making pretty with rod, reel and creel.

A rock slipped and so did Earl. Undeterred by the pratfall, he finished the assignment with the leg in a cast.

The chaps who wisecracked about the soft life of a magazine photographer had to pitch in and help. John Day, host of the party at Table Rock Estates, Lee Bowman, Ward Bond, and Niven Busch,

helped him finish the assignment. They used Earl's two Rolleis and a $3\frac{1}{4} \times 4\frac{1}{4}$ Speed Graphic.

It's dangerous work—if you can get it. Another lensman, Eliot Elisofon, also returned from an assignment with broken mementos. Three of his cameras were knocked out by heat, humidity, bumpy PBY flying boats, and jolting jeeps during a 7,000-mile Pacific picture tour.

About our new paradise islands and palm-studded atolls, usually loquacious Eliot had only one word to utter, "Rugged."

Moral: Amateur photographers have all the fun because they shoot 1. only what pictures they like, 2. only when they want to, and 3. only how they please. They have only themselves to satisfy.

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Darkroom Troubleshooting—Prints

There are times when almost every darkroom worker finds himself plagued by print defects of one kind or another—stains, spots, scratches, or what have you—usually because of carelessness on his part. Here's a handy guide that will help you put a finger on the weak spots in your darkroom technique and eliminate them.

Fogging

A fogged print is one that lacks the sparkle and lustre it should have. If fogging has been slight, the only indication of its presence may be a "veiling over" of the highlight areas in a print. More pronounced fogging gives a gray cast to the print and white areas take on a muddy look.

The most common causes of fogged prints are light leaks around darkroom windows and doors, and safelights that are either too bright, too close to the developing tray, or that are used with the wrong color of filter. Always use the safelight filter that's recommended in the instructions furnished with each package of contact or enlarging paper.

Prolonged development, exhausted developer, or too much exposure to air during development, will also cause prints to become fogged and sometimes even stained in spots. The common practice of lifting a print from the developer and holding it close to the safelight for inspection invites fog from oxidation as well as from the safelight itself. Mixing developer in steaming hot water, excessive stirring, excessive shaking of bottled developer, all contribute to oxidation and increase the hazard of print stains and fog.

Yellow Stains

Yellow stains arising from development are caused by oxidation resulting from the use of old or badly discolored developer or by failing to keep a print completely immersed during development. Developing large batches of prints at a time in small quantities of overworked developer should be avoided. To remove yellow stains a bleach and redevelop formula is generally effective. The following formula softens the emulsion and should be preceded by a hardening bath consisting of:

Formaldehyde	10 cc.
Monohydrated sodium carbonate....	6 grams
Water to make	1 quart

Bleach—Solution A

Water	1 quart
Potassium permanganate	5.2 grams

Make sure the potassium permanganate is completely dissolved. It's advisable to filter this solution before use.

Stock Solution B

Water	1 quart
Sodium chloride	75. grams
Sulfuric acid	16 cc.

Pour sulfuric acid very slowly to avoid heating or explosion. Use equal parts of solution A and B. Bleach about three minutes, rinse in water and clear in a solution of 1% sodium bisulfite. Expose to strong electric light or sunlight, then develop in the following:

Sodium sulfite—desiccated	24. grams
Amidol	7.5 grams
Water	1 quart

Immerse until the image is completely re-developed and wash well before drying.

Other Stains

Most other stains appear white or gray; some may turn out to be spots which stick to the print and can be removed by swabbing. Silver sulfide formations, foreign matter, and organic growths in the tray due to improper cleaning, all contribute to print-spotting during development. Similar looking spots sometimes also occur during fixation or washing. In every case the cause is traceable to weak solutions or lack of cleanliness. If yellow stains occur in the fixing bath, they are caused by oxidation of the developer in a fixing bath that's too weak. If the stains occur in the stop bath it is either because the stop bath is too weak to neutralize the developer, or because the print is

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not completely immersed in the bath.

To make it easier to detect the cause of the spots at their source, it's usually safe to assume that yellow or brown stains come from the developer—although they may occur also in the rinse or fixing baths whenever either of these solutions falls below normal strength. White stains and spots are the result of contamination of the fixing bath or wash water.

Black Specks

Black specks on a print can be just as troublesome as large stains and spots. In tracing them, it's best to inspect the negative carefully before checking developing solutions. Tiny pinholes or scratches on the negatives are the worst offenders in this regard. Since very close inspection is usually necessary to detect these flaws, the negative should be held close to a strong light and viewed from all angles. Remember that a few degrees of enlargement will give a tiny pinhole quite imposing proportions. Before making prints or enlargements, spot the blemishes with spotting colors, dye, or other material that will make them opaque.

Chemicals which have not been completely dissolved in the developer will cause black specks and even larger blemishes. Here the quickest cure is to filter the solution very carefully.

On rare occasions you may be troubled with black specks even though the developer has been carefully prepared and filtered. Change from one package of paper to another and if the specks don't show up you'll know there's something wrong with the emulsion of the paper you were using. This is not a common occurrence, fortunately, but it has happened.

White Specks

These can be caused by imperfectly dissolved chemicals in the developer, short stop, or fixing bath, but the most common cause of white specks is dust.

Dust on the negative, glass carrier, contact printer, condenser lenses, or floating dust that settles on the enlarging paper while the exposure is being made, all produce white specks. Negatives should always be dusted with a soft brush before printing and all glass surfaces used in either printers or enlargers should be cleaned and dusted

at frequent intervals.

A wide assortment of marks, spots, and other blemishes of all shapes and sizes are the result of careless handling of prints while they are being processed. Small blisters may be caused by solutions which are too warm. Bubbles in any solution are apt to leave peculiar marks.

Darkroom Bugaboo

The dust from dried hypo can cause so much trouble that it deserves special attention. Don't let hypo splash on the floor or walls of your darkroom. After it dries it becomes a dust which is easily picked up or kicked about, and when it lands on sensitized material it's sure to leave spots wherever it touches. Many white spots have been blamed on air bubbles when hypo dust was the real cause.

Cleaning Trays and Tanks

Trays, tanks and bottles used in mixing and storing photographic solutions become stained and coated with various products as a direct result of the chemical reaction that takes place in the solutions. If your containers are always used for the same types of solutions, you're not so likely to run into this condition. Regular cleaning of all containers is, however, a fine way to prevent spots and stains. Frequent cleaning in the following solutions will make unnecessary more drastic measures which would be needed if the trays and tanks were allowed to become badly stained or coated.

A 1% solution of potassium permanganate will oxidize many stains and deposits which can then be washed away. A brownish substance may be formed by oxidation of the permanganate; this can be removed by treating it with a 5% solution of sodium bisulfite. The container should be thoroughly washed in running water after the cleaner has been used.

An alternate solution for cleaning purposes is easily made by dissolving 3 ounces of potassium bichromate in 32 ounces of water. Slowly add 5 ounces of sulfuric acid. Be sure to add the sulfuric acid to the bichromate solution and not the reverse. This solution should not be used with white enamel trays unless they are of the acid-proof variety. Wash trays or tanks in running water.

—George Boardman

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BOOK REVIEWS

By CLARENCE W. KOCH

Weegee's Naked City

Zebra Picture Books, 25¢

A NEW IDEA in book publishing appears on the nation's newsstands this month and may result in a greater income for several hundred photographers. Up to now, the 25¢ pocket book reprint has concerned itself with novels, biography and history. There are 22 publishers of pocket books and they issue about 500 different titles a year. These usually sell for a quarter and the author and the original publisher divide between them a royalty which amounts to a total of one cent or a cent and a half per copy. Thus on a pocket reprint title



WEEGEE

Skippy Adelman

selling 100,000 copies, the author will receive about \$500. Pocket reprints have benefited authors everywhere and have helped, rather than hurt the sales of the original higher-priced edition. Now photographers will have a chance to benefit from the same idea. George Rosenthal, whose baseball photographs appeared in MINICAM in September 1948, created a new book publishing firm, Zebra Books (all the pocket reprint people seem to enjoy using animal names) and will issue reprints of photographic books. The first Zebra Book is "Naked City" by Weegee. It is pocket size, printed on good paper, and contains about 100 of Weegee's well known photographs. "Naked City" is on sale at all newsstands.

U. S. Camera Annual—1949

Edited by Tom Maloney

U. S. Camera Publishing Corporation \$6.50

THIS is the fourteenth annual published since its first appearance, and its two volumes are once again consolidated into one book. The last few years have seen a separate book for each of the two volumes, through they were sold only as a unit.

The first section—or volume—consists of "Fine Photographs" but the title "fine" would seem to resolve itself into a matter of opinion or interpretation; many will agree with the publishers; others, perhaps, will disagree.

Volume II is composed of news pictures and if you like your photographs realistic as well as (sometimes) gory, you'll thoroughly enjoy this section.

A few illustrations reproduced in color, the plates of which originated with Condé Nast (as used in "Vogue"), and from Eastman Kodak Company, complete this annual. The book contains 392 pages and even more illustrations.

All the Photo-Tricks

By Edwin Smith

Focal Press \$3

ALTHOUGH the majority of the tricks mentioned in this book are by no means new ones, those listed do serve to refresh one's memory and enable him to make use of the ones he has occasion to use.

The validity of the tricks are doubtful except, perhaps, for the novelty or amusement procured thereby, but their continued usefulness ends there.

Probably the most applicable of the chapters is the one dealing with photomontage which includes cut-out and paste-up and double exposure. The author has covered fully the photo tricks, from the use of a lazy shutter to printing on apples.

This book contains 277 pages and 63 illustrations.

Commercial Photographic Lightings

By Charles Abel

Greenberg \$7.50

SIMILAR in style and purpose to its predecessor, the widely read "Professional Portrait Lightings," this book will appeal to the commercial photographer whose desire it is to furnish the best possible illustrations for his clients and who, because of unanticipated complications, may not be able to deliver the finished product in the time allotted him.

The book breaks down a goodly number of subjects from a simple coil of wire, to a more complicated tug boat engine room. It includes in its 272 pages the work of 77 better known professional photographers, each one presenting, in addition to the final print, a complete diagram of the lighting, the equipment used, and the technique involved.

Here the photographer will find ideas to

compliment his own and will be saved immeasurable time and expense which might otherwise be used for experimentation.

The amateur or hobbyist, too, will benefit from the many lighting diagrams, as these can be commendably applied to a still-life, a portrait, or an interior of his home.

For those of you who prefer to be shown, rather than told, how to shoot a picture, "Commercial Photographic Lightings" is a good bet.

Popular Mechanics Photo Handbook

Popular Mechanics Press \$2

REPLACING the highly successful "Photo Guide" which was published six years ago, this book fills the need for a volume devoted, in most part, to the home construction of photographic equipment and supplies by the individual whose waxing hunger for a more complete darkroom has gone unsatisfied because of limited funds.

The third and most important section of the book is related to the "Make It Yourself" idea, and the reader is shown how many vital items can be constructed with but little skill and few tools.

Two other sections complete the book. The first section concerns the taking of pictures and advances from the elementary technique of the beginner to the more polished skill of the advanced worker.

The second section is devoted to the darkroom and its use, and describes handy short cuts which enable the technician to save count-

less minutes and many failures.

The 156-page book is packed with ideas and suggestions, and the abundant illustrations very likely reach six times the number of pages. If you like to tinker—and who doesn't?—this book is worth examining.

Amateur Photomicrography

By Alan Jackson

Focal Press \$2.75

HERE is a field about which little is known and still less has been written, but which is indeed a fertile field for any enthusiastic amateur seeking to delve into a world of fantasy.

In his efforts to secure striking designs and remarkable arrangements, the photographer has access to countless new and varied subjects for his camera. With simple and inexpensive apparatus and with a little care, even pictorial effect will not be wanting.

Nothing has been omitted from this little 180-page book with its 47 photographs of great charm. The author covers the field thoroughly and effectively from the beginning to the end. If you wish to leave the realistic and documentary photographic world for one of a venerable fairylane, then this book certainly should be reserved for your library.

All the books reviewed in this column are obtainable from the Book Department, Minicam Photography, 22 East Twelfth Street, Cincinnati 10, Ohio, postpaid, at the prices indicated.



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SALONS AND EXHIBITS

★ FOLLOWS P. S. A. RECOMMENDED PRACTICES

Closing Date	Name of Salon	For Entry Blank, Write to	Number of Prints and Entry Fee		Dates Open to Public
Exhibit to see]	36th Annual Pittsburgh International Salon of Photographic Arts.				Carnegie Institute, Pittsburgh, Pa., Mar. 18-Apr. 17
Exhibit to see]	Thirteenth Virginia Photographic Salon.				Valentine Museum, Richmond, Va., Mar. 20-Apr. 10
March 5	★Fifty-seventh Toronto International Salon of Photography.	Salon Secretary, Toronto Camera Club, 2 Gould St., Toronto 2, Ont., Canada.	4	\$1.00	Eaton's Fine Art Galleries, Toronto, Ont., Canada, Mar. 21-Apr. 2
March 14	★Third Michigan International Exhibition of Nature Photography.	Roger E. Richard, Chairman, 1832 N. Gulley Rd., Dearborn, Mich.	4 prints and/or color slides	\$1.00 each division	Cranbrook Institute of Science, Dearborn, Mich., Mar. 23-Apr. 19
March 17	Sixth International Exhibition of Pictorial Photography.	R. J. Edwards, Secretary, 10 Victoria Road, Runcorn, Cheshire, England.	4	\$1.00	Runcorn Camera Club, Runcorn, Cheshire, England.
March 18	5th International Salon of Photography.	G. N. Jelcoat, Exhibition Secretary, 7, Cumberland Grove, Norton-on-Tees, England.	4	\$1.00	Norton-on-Tees Photographic Society, 7 Cumberland Grove, Norton-on-Tees, England, Apr. 16-23
March 29	Southgate International Exhibition of Pictorial Photography.	W. J. Linbird, Exhibition Secretary, 2, Dennis Parade, Southgate, London, N. 14, England, or Victor H. Scales, 51 E. 10th St., New York 3, N. Y.	4 mono-chrome or color prints, or color transparencies	2/6 or 50 cents each class	County Library, Southgate Town Hall, Palmers Green, London, England, Apr. 30-May 7
April 1	★2nd Annual Salon of Marine Photography.	Henry T. Sharp, Jr., 3 Sunset Road, Hilton Village, Va.	4	\$1.00	Mariner's Museum, Newport News, Va., Apr. 3-30
April 4	★Ninth Syracuse International Salon of Photography.	Miss Reby Francisco, Salon Secretary, 240 Kirk Ave., Syracuse, N. Y.	4 mono-chrome or color prints, or color transparencies	\$1.00 each section	Museum of Fine Arts, Syracuse, N. Y., Apr. 20-May 15
April 11	★8th Montreal International Salon of Photography.	William Sims, Salon Secretary, 810 Buchanan St., Ville St. Laurent, Montreal 9, P. Q. Canada.	4 mono-chrome and/or color prints	\$1.00	Museum of Fine Arts, Montreal, Canada, May 14-29
April 14	★Sixth New Zealand International Salon of Photography.	H. A. Larsen, Box 324, Hamilton, New Zealand.	4 prints and/or slides in 4 sections	\$1.00 or 5s for b. and w. or color division	Art Gallery, Hamilton, New Zealand and other cities, May 9-Aug. 30
April 16	★Second El Camino Real International Color Slide Exhibition.	George F. Brauer, Chairman, 1946½ Lovelace Ave., Los Angeles 7, Calif.	4 transparencies	\$1.00	6 California cities, May 2-8
April 30	First Halifax International Salon of Photography and Color Slide Exhibition.	W. Ray Isnor, 217 Agricola St., Halifax, Nova Scotia, Canada.	4 prints and/or color slides	\$1.00 each division	Lord Nelson Hotel Halifax, Nova Scotia, Canada, May 25-27

When writing for Entry Blanks, mention MINICAM

PRODUCTS-NEWS ABOUT

NEW PRODUCTS-



Darkroom Chemical Data

If you have a darkroom you'll probably find the new Eastman booklet, "Kodak Chemical Processing Aids," a big help.

The chemicals described include anti-calcium, anti-fog, anti-foam, and other similar developing aids, as well as the Kodak Testing Outfit for determining fixing and stop bath usefulness. Pertinent data on the preparation, use and keeping quality of these chemicals is given in detail.

The booklet is punched for insertion in the Kodak Photographic Notebook and is free for the asking from . . .

Sales Service Division
Eastman Kodak Company
Rochester 4, New York

Editing Without Eyestrain

"No stoop, no squint," says Mico Photo Products about their new film editor. Something

new in film editors, it projects a large-size brilliant image, right side up, on its built-in viewing screen.

Constructed of light weight die-cast aluminum, the Mico Film Editor incorporates such features as a notching device to mark splices, stainless steel film track for full protection against scratches, and ventilated lamp housing with 30 watt bulb. The optical system consists of double condensers, projection lens, and polished prism.



Mico Photo Products Co.
119 South Dearborn Street
Chicago 4, Illinois

Flash Extension for Argus C-3

A 3-foot flash extension cord is now available to Argus C-3 owners. The extension permits better control of flash lighting and avoids the flat, harsh lighting common to so many flash pictures.

It plugs directly into the camera jacks, or into Adapt-A-Flash Extenders when installed.



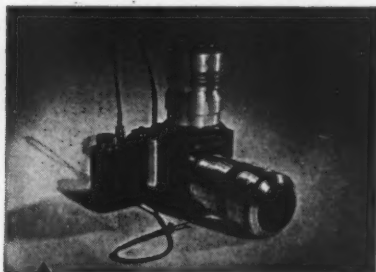
The Simmons OMEGA B3 Enlarger

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Just released and ready for delivery, the new OMEGA B3 Enlarger bears the DELTA stamp of approval. Beautifully designed and constructed, this fine instrument is worthy of your negatives. Fully autofocus through the entire enlargement range, it has a triple condensing system, which permits complete and efficient illumination for all lenses from 2" to 4". Tilting and rotating negative carrier permits correction in printing. Newly designed "V" type beam girder support insures lifetime service. Color head is built-in and supplied at no extra cost. Available in limited quantities, get your order in now to insure prompt delivery.



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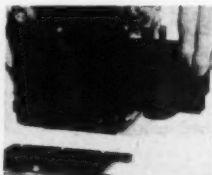
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Los Angeles 42, California

New Roll-Film Adapter

Ever wish you could use roll film with your Miniature Speed Graphic? Now it's possible with the Suydam Combination Roll Film Back for 2 1/4" x 3 1/4" Graphic or spring-type back cameras. What's more, once the new Combination Back is installed, you can switch from standard cut film holders and ground glass focusing to roll film in an instant—since the roll film adapter is equipped with a dark slide, the change can be made anywhere, anytime.

Here's how it works. The Combination Back consists of a special two-piece panel which is mounted in place of the focusing panel supplied with the camera—it's furnished ready-drilled and tapped for easy screwdriver installation. The ground glass and folding hood of the new focusing panel is removed by merely sliding it out, and a size 120 roll film adapter slides in



its place. No changes are required in the focusing scale and rangefinder of the camera, and the Combination Back and Roll Film Adapter are constructed so that the focal planes of ground glass, roll film in the adapter, and cut film in standard holders are identical.

E. Suydam and Company
2080 Lincoln Avenue
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Multiple Swivel Light

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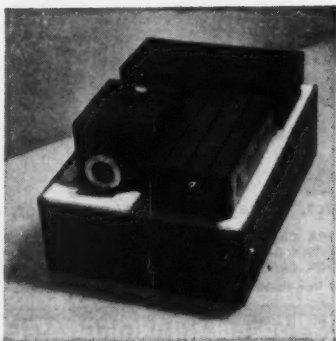
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Outstanding feature of the new lamp is the flexibility provided by its two outer arms. Each swivels a full 350°, locks in any position desired. With arms completely extended, the unit measures 44" across. A convenient three-way switch permits use of all four lights or the two inside ones as desired. Light in weight, the unit folds down to 24½" for easy carrying. It is furnished with a heavy-duty 4-foot rubber insulated cord.

Luminator, Incorporated
120 North Peoria Street
Chicago 80, Illinois

Look! No Hands!

Here's a new idea for reflex camera users—the Body Pod permits free use of both hands in taking a picture and even allows, "with careful application," shooting at speeds as slow as 1/5 second.



Developed by a Cincinnati news photographer, working with a development engineer, the Body Pod is unusually versatile in operation. It consists of a flanged base unit fitted with a standard tripod screw, a connecting link with double up-and-down universal joint, and a chest bar equipped with an adjustable strap. It is used with the neck strap furnished with the camera. Constructed of stainless steel, the Body Pod weighs less than eight ounces and comes apart in three sections for easy carrying.

William V. McNeely Co.
411 Horace Street
Cincinnati, Ohio

Controlled Contact Printing

Top feature of the new Compco contact printer is its controlled argon lighting system. Four argon lamps, each on an individual

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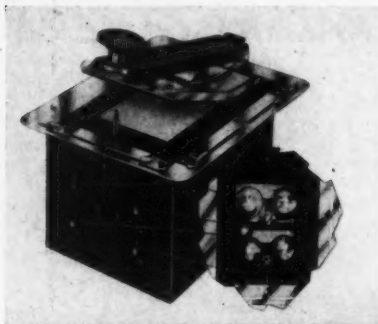
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KALART

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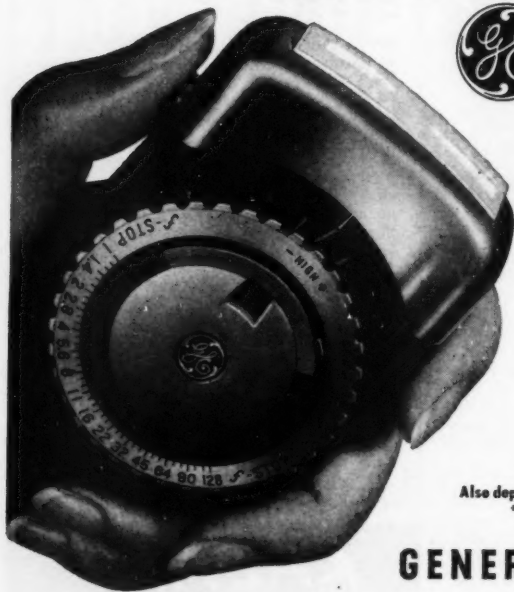
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29th Annual Print Competition

A closing date of March 15, 1949, has been announced for the 29th Annual Competition of *American Photography* and *The American Annual of Photography*—so better get those prints in the mail soon. Any number of prints, mounted or unmounted, may be submitted and there is no entrance fee of any kind. Twelve cash prizes of \$25.00 each, and eighty or more subscriptions to *American Photography* as Honorable Mentions, will be awarded. All prints except the twelve prize-winners will be considered for *The American Annual of Photography, 1950*. For entry blank and complete details, write American Photography, 353 Newbury Street, Boston 15, Massachusetts.

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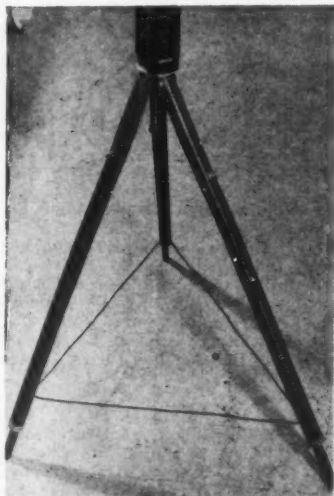
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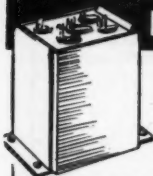
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CAMERA CLUB NEWS AND IDEAS

LEND ME YOUR EARS . . . The *Boston Camera Club* heard Mr. Frank R. Fraprie talk on the "Ideas on Creating Pictorial Prints." The *Cleveland Photographic Society* has scheduled a lecture series in which one prominent pictorialist a month will speak. Who are the speakers? Why, no less than Philip James Croft, Axel Bahnsen, Mildred Hatry, Harry K. Shigeta, and P. H. Oelman. The lecture series will run from January to May. Not to be outdone, the *Delaware Camera Club* will have as its speakers Alfred De Lardi and Eleanor Parke Custis. The *Green Briar Camera Club* had the pleasure of a demonstration and an address on portraiture by Fred Archer.

A MODEL CAMERA CLUB . . . No one complained of a lack of models the evening of the *Washington Council of Camera Club's* convention. Five of Seattle's best known were available; there was no need to rush either for the Council gave out the models' names, addresses, and telephone numbers. My, what trusting souls! The *Trenton Camera Club* of New Jersey didn't do bad either. They had a Conover model, no less, for their Color Studio Nite. She was six-year old, Martha McGrath of Newark. The *Toledo Camera Club* is publishing in its bulletin, "Light Reading," an expedient article on "An Introduction to Pictorial Composition" by Lyman W. Close which is really tops. The *Manhattan Camera Club* has done something similar in its "Amacam" authored by Harold Arrigoni titled "On Photographing Children."

LOOKING FOR SUBJECTS? . . . The *Montreal Amateur Photographers' Club* has selected for one of its subjects for print night, "Abstract Study." It's an idea more camera clubs might use to advantage when they mete out assignments for print competition. Also given in that club's bulletin "The Monthly Review" is a formula consisting of two stock solutions which, by different dilutions, either D-72 or D-52 developers may be made up from the same stock solutions. If sufficient interest is shown by way of letters to MINICAM, the formulas will be published in a later issue.

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THE LAST WORD

(Continued from page 12)

so that the lens caught only the reflection of the ceiling in the tin, and the ceiling was lighted as evenly as possible with two floods. Then the water was sprinkled on the tin until it ran and formed the right sort of shapes. The camera was focussed, of course, on the "raindrops," and exposure was made according to Weston meter, reading directly from the tin, and placing the reading on "C" on the meter scale. Development was 25% above normal.

Then this negative was simply sandwiched with the negative of the figure in printing.

Remember another stumbling point though—the tin is a mirror, which makes it difficult to put the camera just where it should be, so it has to be off to one side just a little. That means you have to be using a camera with swings and tilts to get the plane of focus to coincide with the plane of the tin.

Burbank, Calif.

DERALD MARTIN

Captioning Worries

Sirs:

I follow your Photo Markets and have sold a few pictures as a result. I think I could sell

more, though, if I knew how to caption my pictures better. Can you make any suggestions?

Helena, Mont.

CHAS. BUSCH

• There is no "rule 'o thumb," of course, for captioning pictures, but you can pretty well bet that an editor will want to know the same things about a picture that he expects to find answered in a manuscript, namely: Who, What, Where, When, and Why?—Ed.

Tissues For The Platnicks

Sirs:

By way of a question, I noticed in the photo of Pop Platnick working in the darkroom (Dec. issue—Ed.) that there was a great deal of smoke rising from his cigarette and forming an almost impenetrable cloud about the enlarger lens. Since I stopped smoking in my darkroom I find that my enlarger lens and condensers need much less cleaning than formerly and I have very little use for a large box of lens tissue I have on hand. Can the Platnicks use it?

Seattle, Wash.

FRED C. REEHL.

Framed In Dakar

Sirs:

I like this picture because I feel it has interesting composition due to unique framing. I made it with a Bantam Special in Dakar,

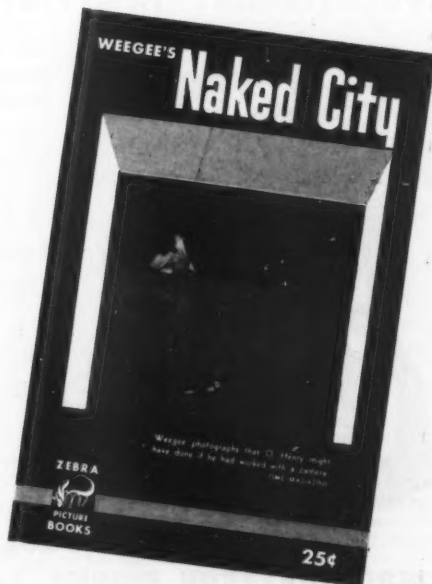
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CLYDE ALLISON



Schlivek Will Go Places
Sirs:

Since your very first issue, MINICAM has been

a favorite in our house, but the December issue received the warmest reception of all. The reason: an article by a superbly accomplished young lady whom I like very much—Mary Shaw Schlivek, *Journey To Argentina*. Just in case you don't know Mary personally, let me say that she will be well worth watching in photography. Her work will be absolute perfection, with love, effort, and human understanding all rolled into one.

University of Maine.

MARIE RYCKMAN

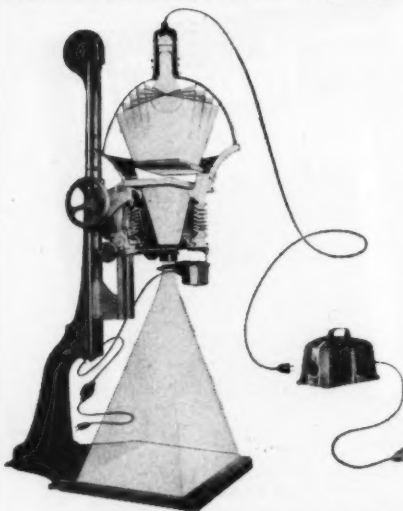
Pups Have Personality

(Continued from page 77)

try putting them on a high table where they are confined to a small area within the coverage of your lens. Then give them something to hold their attention. A familiar command, petting, a whistle, or their favorite tidbits will encourage them to hold a pose while you shoot.

Backgrounds should provide a contrast with the coloring of the dog. A blanket or a large piece of cardboard work out well. The board can be curved up behind the subject to form a "seamless" background, or may simply be weighted in front of the subject so it extends smoothly out of view.

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Tracking The Electron

(Continued from page 56)

The faster the stone is travelling, the less the frequency of the skips in the water. This is similar to the passage of a high energy particle through a nuclear emulsion. As with the skipping stone, the rate of energy loss is shown by the number and spacing of grains along the track. . . ."

He added that from the length and curvature of the track and the grain-spacing along it, scientists are able to determine information about the particle's speed, energy, and other characteristics—very important stuff in nuclear research.

Another, and perhaps more immediate benefit, will be the new emulsion's application to autoradiography in medical research. In autoradiography, sections of tissue containing radioactive isotopes are placed in contact with the film and the tissue specimen takes its own picture when radiation exposes the emulsion. Examination of the developed plate then enables scientists to tell the amount of radioactive material present and how far radiation has penetrated into the tissue.

The new ultra-sensitive plates are not yet generally available to research workers—Kodak has a packaging problem to solve first. It seems they've made the emulsion just a little too hot to handle. No sooner is it finished than it goes to work—recording the bombardment of cosmic rays which strike all about us constantly from outer space. It's estimated that six electrons from cosmic rays strike each square centimeter of the emulsion every minute. Figuring from this, Kodak gives their new emulsion less than three days life; after that it's so peppered by the barrage of cosmic rays that it's clouded with streaks upon development.

So far, the only solution seems to be shipment in dry ice. Since the emulsion's sensitivity is reduced at low temperatures, dry ice would protect it to some degree during shipment. On arrival, it could be refrigerated and later permitted to warm up just before exposure. Does anyone have any bright ideas?

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Billy Bitzer, Ace Camera Man

(Continued from page 67)

with a cloth between shots to protect his innovations from the opposition. Those were the days of fierce competition between the independents and the "Trust" and rivals stopped at nothing to beat their competitors.

Griffith and Bitzer were working well together and in June of 1909, in *The Lonely Villa*, we find the first use of cross-cutting to heighten suspense throughout two sets of parallel scenes. It was here that the first use of the "last minute rescue" appeared. Griffith further developed and experimented with this device in *The Lonedale Operator* in 1911. He was bringing Bitzer's camera closer and closer to the actors in scenes where emotional inter-play or small gestures were important. In *Ramona* he went to the exact opposite and introduced the very long or extreme long shot. Thus new and broader dramatic horizons were opened up for atmosphere and movement. The early confines of the first films with their limited stage was broken and movement was now possible on a vast scale. The motion picture was really beginning to move!

Griffith's films were not only fresh in camera treatment but enhanced by expert cutting. There was a daring and freshness about these early pictures that can still be discerned today when compared with contemporary films. While their rivals were content with merely recording an image, Griffith and Bitzer were creating whole new worlds on film. Together with their hard-working crew they knew they were in the thick of something big, on the edge of new and strange horizons. They were exploring the unknown and their new discoveries and technical successes sometimes baffled and surprised them almost as much as it did their audiences.

All of this early experimenting was leading up to the making of their masterpiece—*The Birth of a Nation*. Griffith decided to sever his ties with Biograph in late 1913

after producing *Judith of Bethulia*—a long, intricate, costly picture. This was the American four-reeler and Griffith's ambitions and plans for future expensive productions frightened his bosses sufficiently to cause them to let him go. It is notable that although Billy Bitzer was recognized at the time as the industry's top cameraman, and had been with Biograph for fourteen years, he had the courage to quit and go to the west coast with Griffith. Billy at first declined to go, although Griffith offered to treble his salary, because he didn't think Griffith's spending of both film and money would keep him going very long as an independent. But he went and the result is film history. The effect of *The Birth of a Nation* on the movie industry and the movie-going public can not be overestimated.

It seems fantastic, in looking back, that such an epic could have been made with one simple camera, a Pathe worth about \$300, and with just two lenses. Billy had the standard two-inch F:3.5 lens and a wide-angle objective which were interchangeable. No turrets, remember; he had to unscrew one and screw in the other! The Pathe was a clumsy wooden box with the crank in the back, instead of at the side, and it had no means of positive registration as in modern studio cameras, such as the Mitchell, whose cost runs as high as \$18,000, or Technicolor's \$40,000 instruments.

Many scenes in *The Birth of a Nation* have been compared in quality with Brady's epic photographs of the Civil War. This resemblance is not entirely accidental. The entire picture was shot in daylight, with the exception of a few night shots lit by flares, on the slow orthochromatic film then available. Although the film was, of course, faster than the emulsions Brady coated on his wet plates, the color sensitivity would be roughly similar. But this alone does not account entirely for the similarity. Bitzer bribed a librarian with a box of candy to allow him to study some actual photographic prints of the famous Civil War collection. Thus Bitzer was the first cameraman to research his

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material and create a definite photographic style to fit the subject and make for greater authenticity.

The Birth of a Nation was the turning-point of the motion picture industry—it was now Big Business. The movies were now accepted by even the severest critics as a new art form. They were no longer shunned by the Theater and the public as something degrading. *The Birth of a Nation* blended melodrama, heart throbs and romance with big mob scenes of armies fighting and masked horsemen dashing through the night and it was acted, directed and photographed in a manner hitherto unknown to the screen.

Bitzer's camera work is noted particularly for his daring lighting. Working in an era when motion picture lighting consisted of enough sunlight to flood the scene so that a recognizable image could be recorded, it is remarkable that he had the courage to so brazenly break the rules. Under anyone less than Griffith he wouldn't have dared to try such innovations as back-lighting, with reflectors to fill in the shadow side. These were not "hard" polished metal or tin foil reflectors but "soft" cloth ones casting a subdued fill light that was hardly noticeable as reflected light but was sufficient to bring out the shadows. Considering the contrast range of his slow ortho negative, it is amazing that he was able to record such subtle effects. Bitzer even went to the extreme of allowing light to fall directly on the lens if that was the only way to get what Griffith desired!

Hollywood still speaks of Griffith's *Intolerance* with awe—its massive sets, its tremendous crowds, its extravagance of both money and film have rarely, if ever, been surpassed. In this attack on prejudice and cruelty Griffith tells four parallel stories of injustice throughout the ages. The film is an epic sermon which took two years to produce. Architecturally the sets for *Intolerance* were far more pretentious and costly than those of any other film up to that time. Gigantic plaster elephants rose a hundred feet above street level; the towering buildings of Babylon stretched, a

profile of ancient Asia, across the sky. Thousands of horses and sheep grazed along the green enclosures, while hundreds of fighting men, their swords and helmets flashing in the brilliant sunlight, mingled with the vast crowds. As many as 15,000 people were filmed by Bitzer's camera in certain key shots. It seemed as though the entire population of Los Angeles had turned out to take part in the various pageants and mighty rushing armies.

Although *Intolerance* was never a popular success, it is of extreme importance in cinema history. It is a model of fine cinematography and expert editing. Its magnitude and complexity influenced motion picture making in both America and Europe for many years to come. *Intolerance* became the textbook by which all future epic films were produced.

Much of the camera technique and cutting was copied by the Germans and the Russians and re-introduced in their epic pictures years later. This has led to the erroneous idea that they developed much in the way of new camera angles, camera movement and fast cutting. Griffith did all there was to do, said all there was to say—what came later was merely repetitions. *Intolerance* reached the incredible length of eighty reels (twenty hours' projection time!) and cost approximately two million dollars. It was finally released in twelve reels. This sheer spectacle type of picture was not to be seen again until years later when C. B. DeMille became the producer best known for this kind of screen fare.

The modern amateur movie maker could well take a tip from the notebooks of Billy Bitzer and achieve a finer quality in his home movies if he would but substitute clear thinking, imagination, experimentation, and clever ideas for a battery of lenses and needless gadgets. After all, it is the way the camera is used that counts. It is what is placed on the film—the ideas and thought that the cameraman puts into his cinematography and not how fancy his equipment is—that really makes the difference. Make the handicap of less pretentious equipment a challenge to your im-



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agination. Remember that the motion picture is a medium to tell a story and that the camera is only a tool used in the process.

So much of what Bitzer put on film has been absorbed into routine motion picture technique that it is difficult to properly appreciate his many contributions. In their day they were a new kind of story-telling magic that established the Motion Picture as an art form, ushered in the Golden Age of the Cinema and made the American movie the world's most popular and best loved entertainment.

Candids In The Dark

(Continued from page 87)

ordering addresses appears at the end of this article.

Dissolve the gelatine in 500 c.c. of the water. Then dissolve each dye in a separate container, using about 77 c.c. of water for each dye. Add a little of the gelatine solution to each dye solution, and also add gelatine to the glycerine. Then add the eosin to the rest of the gelatine solution, followed by the other dyes in the order named in the formula. Add enough water to bring the total volume up to one liter. If necessary, filter the solution through two layers of muslin and allow to stand overnight.

When the solution is mixed and you are ready to coat the bulbs, heat the solution to about 95° F. Dip each bulb twice, or until the sun can just be seen through the bulb. Then let the bulbs dry for 24 hours before use.

If you are lucky enough to get a few factory-coated bulbs, the dye on them can be made to serve for several shots. Save the bulb after firing it, and scrape the coating off. Dissolve the scrapings in enough acetone to make a syrupy solution, and dip the plain bulb in it just as if it were the mixed coating solution. It will probably take more dippings to get the same coating of dye than it would take with the mixed solution, but the end result will be the same.

Guide numbers are used to determine

the exposure for infrared flash, the same as for any other flashbulb. These numbers were discovered in the late thirties, and are constant for any combination of film, bulb, and shutter speed. They are the product of multiplying the bulb-subject distance in feet and the aperture necessary for proper exposure at that distance. Thus if either the *f*/stop or the distance is known, the other can be found quickly by division. To find distance, the *f*/number is divided into the guide number, with the result being expressed in feet. To find the proper aperture, the distance is divided into the guide number and the result is the stop needed. For instance, if you are using Superpan Press with a GE #5 bulb at 1/100 second (which has a guide number of 250) and you are fifteen feet from the subject with the bulb on the camera, the correct stop to use is *f*/16. ($250 \div 15 = 16\frac{2}{3}$. Use 16.)

Approximate guide numbers for commercially available infrared bulbs are as follows:

shutter speed— bulb size	1/50	1/100	1/200
22R or 2R	68	50	35
5R	45	35	23

In actual use, speeds faster than 1/50 second are impossible unless you are very close to the subject and are using a large bulb.

There are two methods of determining guide numbers for home-coated bulbs. Which method to use depends largely on how many pictures you plan to make. If you are going to make only a few pictures, the filter factor method is the best. To use this method, look up the guide number of the bulb you plan to use with a film rated 64 ASA, at the shutter speed you plan to use. Then divide this guide number by 6. The result will be the approximate guide number of the bulb when coated and used with infrared film.

Another, more accurate way to determine the guide number is by making trial exposures. Since this method uses so many bulbs, however, it is not recommended unless you plan to do a large amount of shooting. To determine a guide number in this manner, set up a subject ten feet

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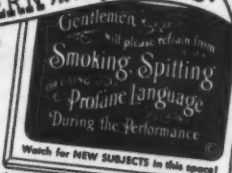
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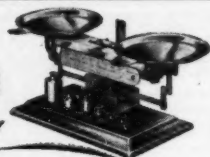
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from the camera, and take a series of pictures of it. Use a different f/stop on each picture, keeping everything else constant. When the pictures are developed and printed, select the one which makes the best print. Multiply the f/stop used on it by ten, and you have the guide number. This method is the most accurate possible, since it takes into account possible inaccuracies in your equipment, developing procedure, and printing technique.

Processing of blackout flash shots, unlike most infrared, does not differ from development of ordinary B&W film. Development times do not need to be shortened, since the normal period of development brings out all possible detail. The film will not become too contrasty, since the flash is apparently considerably softer than ordinary flash. Development times run about the same as for Super XX or Superpan Press.

Dyes for mixing the coating solution are available from E. I. DuPont de Nemours and Company, Organic Chemicals Department, 7 South Dearborn Street, Chicago 3, Illinois, or from the Central Scientific Company, 1700 Irving Park Road, Chicago 13, Illinois. Dupont offers the following dyes:

Dupont Azo Eosin G (in place of Eosin 2524)—\$1.35 per lb.
DuPont Tartrazine Conc. (in place of Tar. N.250)—\$1.34 per lb.
Pontacyl Violet C4BN (for Coomassie Violet RS)—\$1.25 per lb.
Pontacyl Green NV Conc. 200% (for Liss. Green)—\$3.29 per lb.

Central Scientific has:

Eosin Yellowish Cert.	.91 per 10 grams
Tartrazine	.61 per 10 grams
Wool Violet 4BN	.91 per 10 grams
Wool Green S	.91 per 10 grams

The Dupont dyes are obtainable only in lots of one pound or more, while the dyes from Central-Scientific are in lots of 10 grams. Ten grams of each dye will make a liter of solution, which is sufficient to coat a large quantity of bulbs.

The blackout bulbs themselves can be had on special order from General Electric.

Roll Your Own

(Continued from page 58)

Processing reels, racks, drums and chemicals can be bought from regular dealers. In many cases whole kits can be bought and all you need is the water and the film to process. Both the concerns mentioned above sell processing outfits that vary in price from around \$6.00 for a rack to hold about 30 feet of film, with a loading stand, drying reel and trays, to the more elaborate drum type of reel including stand, drum, dryer and a special metal tank costing about \$20. These can be bought to hold 110 feet of film.

Processing is very simple. After film is exposed in the camera, it is taken to the darkroom and wound onto the reel or drum by hand, spooling it off the camera spool. For short lengths or experimenting, a simple rack and loading stand can be made as in figure 1, and processing done in a large tray or trays to fit the rack.

One of the most satisfactory methods of processing is in the use of a drum rotating on an axle. The one illustrated is wood, painted and made water and acid proof with a coating of acid resistant paint. The round ends can be made from plywood and the cross bars of almost any kind of wood of the proper length. The bars or rods (dowels can be used) have pieces of wooden match sticks driven into drilled holes spaced at intervals about 1/16 inch wider than the film width to act as spacers and prevent overlapping during processing. These spaces are required only in four of the eight rods used.

The axle is a length of broomstick into the ends of which are driven 1/4 inch stove bolts. These bolts turn freely in metal angle brackets sawed and drilled to form bearings. These bearings, in turn, are screwed at proper heights on a wooden stand to hold the drum conveniently during loading of film, processing, and drying, so that the drum can be shifted bodily from place to place while changing solutions and washing. Some form of crank should be fastened on one

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of the stove bolts for turning the drum. It can be made from metal or wood and held by nuts on the bolt.

Figure 2 shows a processing tray, the ends of which are of wood held together with six wooden strips. These strips are covered with a piece of ordinary floor linoleum, painted and given a coat of acid resistant paint. Sheet metal can be used, but makes the tanks or trays rather heavy. Trays should be made to fit fairly close to the drum with an allowance of about half an inch. More than one tray can be made and used for the several processing steps if desired.

The illustration shows the film being loaded on the drum, emulsion side out, and also shows the general construction of the drum-type of processing outfit described above.

As film stretches somewhat when wet, some means to take up the slack should be used on both ends of the loaded film. A simple and widely used method is shown in Figure 5. A wire paper clip is cut and bent to fit in the sprocket holes in the end of the film, and a rubber band is used to take up the slack as the film expands.

If processing chemicals are purchased in kit form all you have to do is follow instructions in mixing and use. There are so many reversal formulas available for mixing your own that it is sometimes hard to decide which to use, since they all have certain advantages. The essential solutions are: first developer, bleaching bath, clearing bath and the second developer. In many formulas and methods the first developer can be re-used as the second developer.

Solutions To Be Used

The following are processing solutions I have been using with good success:

First Developer. Stock solution, to be diluted with equal parts water. Chemicals should be mixed in the order given:

Hot water (about 125 degrees)	32 oz.
Metol	44 gr.
Hydroquinone	190 gr.

Sodium Sulfite 5 oz.
 Potassium Bromide 100 gr.
 Cold water to make 64 oz.

This stock solution keeps well, but the diluted and used solution should be thrown out. Just before immersing film, 15 c.c. of Stronger Ammonia Water should be added to the diluted developer for each 64 ounces of solution. Ordinary household ammonia is not strong enough. You can get the Stronger Ammonia Water from your photo dealer. It contains from "27 to 29 percent ammonia by weight" and is labelled "Stronger Ammonia Water."

The Eastman D-19 formula can be used if you want to avoid possible variations in the strength of ammonia solutions.

Bleaching Solution:

Water 2 qts.
 Potassium Bichromate 1/4 oz. 40 gr.
 Sulphuric Acid 10 c.c.

The Sulphuric Acid should be added to the water slowly. Never add the water to the Acid as great heat is generated by the two. This solution keeps well and can be used until exhausted. Care should be taken, however, as old Bleaching solution can cause stains on the film.

Clearing Bath:

Water 2 qts.
 Sodium Bi-Sulphite 1 oz.

This also can be used over and over again until exhausted.

Second Developer:

This is the Kodak Developer D-72 diluted 1 part to 4 parts of water.

All solutions should be kept in a fairly dark place. Metal caps should be avoided. Cork tops are satisfactory if they are replaced as soon as they begin to show signs of wear. For the type of drum illustrated, two quarts are sufficient to process two or three 25-foot rolls of double 8mm film.

It is important that the temperatures of ALL solutions and wash water be kept between 65 and 70 degrees. Solutions and wash water that are too warm will soften the emulsion unduly and leave it in a state where it's easily damaged by scratches or even by touching. Too-cold solutions will slow up the whole process

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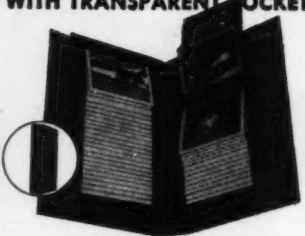
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and may cause underdevelopment. Also, plunging the film from a developer at 65 degrees into a wash water of around 55 or 60 degrees is almost sure to crack the emulsion. A working temperature of 65 degrees is a good standard for satisfactory results. Keeping solutions and wash water as close as possible to this standard, and developing for the time stated with each formula, will help assure satisfactory results.

Here are the processing steps using the drum as shown in Figure 5.

1. The film is first rotated in clear water for about a minute or so to allow the first developer to act evenly and at once.
2. It is then rotated in the first developer for about five minutes, or until the film is as black on the glossy side as on the emulsion side. Temperature should be kept at 65 degrees for best results. If film darkens too quickly it was overexposed in filming. If, after five minutes in the developer, it does not get black, it was underexposed.
3. A five minute wash in running water. This should be a thorough washing, as any developer carried over into the bleaching bath may cause staining. Wash fully five minutes.
3. Bleach for about 3 minutes or until the highlights are transparent.
5. A 3 minute wash.
6. Clear for 2 minutes.
 The white light should now be turned on and all following steps carried out in this light. I use a 100 watt lamp about four feet from the drum, and rotate the drum for about one or two minutes to allow all parts of the film to be thoroughly exposed to the light.
7. Wash for 3 minutes.
8. Re-develop in Kodak D-72 diluted 1 to 4 for about five minutes or until film is thoroughly blackened.
9. Wash for 10 minutes in running water.
10. Wipe film with viscose sponge and dry.

Figure 4 shows how a washing tray can be used between solutions. The tray has a hole in one end plate to hold a rubber bath hose. Two holes in the tray itself near the top brim provide for the outlet so water will not overflow the top of the tray.

Final washing completed, the film is now wound onto the drying reel, running it through a viscose sponge to absorb excess water as illustrated in Figure 7. The drying rack is made from wood, the cross bars being four 1/4 inch dowel sticks.

Ordinarily film must be wound loosely on the drying reel as it contracts upon drying. However, it's more convenient to wind the film onto the reel rather snugly while wiping and then release the tension afterwards. This can be done simply by providing for one of the dowels on the reel to slide down about half an inch or so at each end. One end is clearly shown in Figure 6. After film is wound on the dryer, nails are withdrawn allowing the dowel to slide down and release tension on the film.


Faults To Look For

The whole process of reversal, exclusive of drying the film, usually takes me about 45 minutes for a roll, including the time allowance for manipulating drum and trays between the various steps. Drying time will depend upon the room temperature to a great extent. If done in a dry, warm room, the film usually dries in a couple of hours. I do my processing late in the evening and generally let the film dry over night before spooling onto a projection reel.

Here are some of the principal causes of unsatisfactory results:

1. If the projected film is too dark, it was underexposed in the camera, or underdeveloped in the first developer. Underdevelopment will occur if the developer is too cold or too weak. The most common fault, however, is underexposure in taking the pictures.

2. If projected film is too light, the film was overexposed in the camera. Over-



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development in the first developer can cause too light an image only if the film was fully or somewhat overexposed in the first place. Otherwise development should be carried out fully until the glossy side of the film is as black as the emulsion side.

3. If the finished film has a somewhat yellowish or light amber color, the bleach was not thoroughly washed from the film. To remove the bleach completely, the second washing should not be skimmed but carried on for a full 3 minutes in running water.

4. If, upon projection, the film shows uneven circular spots, the cause is water spots not removed when film was wound onto the drying rack. It is important to run the film through a damp chamois or viscose sponge to remove excessive water before drying.

Kassowitz

(Continued from page 74)

brushwork with Chinese inks. All prints are dry mounted, regardless of size, and receive a coat of wax polish that obliterates evidence of handwork. Kassowitz regards this as necessary in the interest of giving each customer the best possible product. But when it comes to oil-tinting or negative retouching, he makes no concessions. It is his contention that real beauty lies beneath the surface, and that tinting prints or retouching negatives destroys that beauty.

That photography is his livelihood seems to be incidental to Kassowitz. Artistic success, rather than money in the bank, is his criterion. Under no circumstances will he sign his name to any picture that fails to measure up to his standard of perfection. In practice this means proper lighting, exposure, and development as a mechanical matter of course. But above that, it means interpreting the truth. A good portrait, he insists, must tell the truth about the sitter to whatever extent good taste permits. Fortunately there are enough people who appreciate an honest recording of their personality to keep him busy.

Let's Do Some Enlarging

(Continued from page 44)

camera stores.

"Vignettors" can be made by cutting a rough hole in a piece of cardboard of the proper size, or purchased in an adjustable form which allows great variety in shape and size of the vignettted image. "Dodging" tools which enable the operator to hold back the light from certain portions of the negative are easily made at home, or can be purchased in sets of all sizes.

How Enlargements Are Made

Enlargers come equipped with either glass negative carriers or the metal type. If you use the glass sandwich type be certain it is spotlessly clean and completely free from dust. Then place a negative in the carrier so that the *emulsion side* of the film faces the easel or enlarging paper.

Your enlarger will have a filter mounted between the lens and base board so that you can safely project the image onto the sensitized paper for composing and focusing when the filter is swung beneath the lens. Many amateurs prefer to ignore the filter and focus the image on a sheet of white paper or blotter, replacing this with the enlarging paper when everything is in readiness. The enlarger should be turned off or the red filter placed over the lens, while the enlarging paper is being positioned, of course.

There are just two basic operations necessary in operating the enlarger. The enlarger head is raised or lowered on the upright to control the degree of enlargement, and the focusing adjustment is used to focus the image sharply once the proper size has been obtained.

Focusing should be done with the enlarging lens open to its largest aperture. Focus carefully to achieve the maximum sharpness in your enlargements. There are several magnifying gadgets on the market which greatly aid in obtaining the utmost in sharpness.

"Stopping Down" the enlarging lens, or reducing the size of the aperture, should only be done after the focusing operation

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has been completed. Reducing the size of the opening in the lens lets less light pass through and increases the time required for exposure. Stopping the lens down will help to keep your images sharp in the event that you don't focus quite carefully enough when the lens is wide open.

Now that you have your negative sharply focused, lens stopped down, and enlarging paper in place on the paper holder the next step is that of making the exposure.

Your enlarger will be equipped with a switch to turn the light on and off by either by hand, or by means of a foot switch that leaves the hands free for purposes of dodging, burning in, etc. The necessary exposure time for your first few enlargements will have to be gauged by the trial and error method. To avoid wasting whole sheets of enlarging paper, cut a sheet into strips of a size which will be large enough to show some important part of the subject being enlarged. Now comes the matter of timing. Several electronic timers are available which count off the seconds, turn lights on and/or off, or ring bells. Lacking these, you can use any clock with a sweep second hand or a loud tick, or you can simply count.

Exposures should be made to yield a fully developed enlargement within the time specified by the paper manufacturer for the recommended developer. Developing time for most enlarging paper is between two and three minutes. If your test strip is too light, your exposure is too short. If it is too dark, cut down on your exposure time. The only other basic factor that must be taken into consideration when making enlargements is the grade of enlarging paper to use.

Each "grade" of enlarging paper is manufactured for a specific use.

If you are experienced in making contact prints, you will have mastered this phase of enlarging and are already familiar with the several grades of contact papers that are available. Enlarging papers come in four grades of contrast. Number 1, is intended for negatives of extreme

contrast. Number 2, is for negatives of normal contrast. Number 3, is suited to negatives of less than normal contrast. Number 4, paper is for very flat negatives in which there are no strong clear or dense areas, very little contrast.

Special Techniques

You will often want to "crop" a negative in order to get the best possible picture from it. In other words, you will wish to enlarge only the portion that tells the story you want to put over. Quite often you will find that a single scenic or landscape negative will contain more than just one picture. Or if you like to shoot glamor pictures you may find that you are concentrating so hard on getting the mood of the picture that you overlook the unglamorous portions of the subject in the negative. By "cropping" or masking off the unwanted portions of the negative with opaque paper or tape, the desired portion of a negative can be printed without danger of "scattered light" from adjacent areas degrading the print. Masking also helps you select the best format for a picture as you will discover when you end up making a vertical picture from a shot you had originally intended to be a horizontal picture.

The purpose of "dodging" or "burning in" of certain areas of an enlargement is to make those portions print lighter or darker as may be desired. No tools are needed for burning in large areas as the hands may be used to hold back the light from the areas to remain undarkened while the rest of the picture receives additional exposure. Supposing, for instance, that you have a negative of a fine pastoral scene in which the foreground appears much too light even though your test strips have enabled you to arrive at the proper exposure for the rest of the scene. To correct the foreground condition, begin by exposing the entire scene for the indicated time. Then place your hand in the path of the light preventing additional exposure to everything in the scene except the foreground. Be sure to keep your hand moving while you give the

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foreground additional exposure so as to prevent a sharp line of difference between foreground and background. In other words, feel that you are just shading in the area you want darker.

You can, of course, use a piece of cardboard or any other opaque material instead of your hand but most experienced operators, through practice, learn to shape their hands so as to leave tiny holes for extra light to pass through wherever desired. The art of burning-in with the hands is akin to forming the shadowgrams of donkeys and pigs you used to make on the wall when you were a kid.

Vignetting is a different form of dodging but the same principle applies. Cut a ragged hole in a piece of cardboard of the right size to permit just the portion you want enlarged to be exposed. Vignetting is used primarily in portraits and permits you to fade the edges of the picture into a plain white. Be sure to move the vignetting device slowly closer then farther away from the lens as you make the exposure. Don't hold it still. Cutting a circle and leaving it in contact with the enlarging paper during the exposure will give you a porthole effect or even a key-hole effect depending upon the shape of your masking device.

Small areas may be burned in by making small holes in cardboard and you can hold the light back from equally small portions by affixing tiny bits of paper or cotton to thin wires. In each case keep the dodging or burning-in device moving slightly to prevent the effect you want from being too noticeable.

Two or more separate negatives can be made into a composite or "montage" on a single piece of enlarging paper by masking off first one portion of the paper and then the other. A very simple accessory to aid in making a montage can be fashioned by cutting a piece of heavy cardboard into several pieces. This is placed over the enlarging paper with all the pieces in their original position and one piece of cardboard is removed while the first negative is being exposed. This piece of cardboard

is replaced, another negative placed in the carrier, the easel is moved so that next enlargement will be made in its proper place, another piece of cardboard is removed for the exposure and so on until all of the wanted exposures have been made.

You can make enlarged black and white negatives from color positives, enlarged black and white positives from black and white negatives or make reductions. Your enlarger can be used for a copy camera or other types of photography by substituting some sort of a film holder to replace the negative carrier.

You can even imitate a photographer I know who made a three-foot by six-foot full-length enlargement of his wife. He has the picture mounted on heavy plaster board so it can stand upright. This huge enlargement shows his wife standing with feet spread, arms akimbo and a very skeptical expression upon her face. He claims he made it to practice rehearsing his story on when he feels the urge coming over him to buy a better enlarger.

Pictures Like These

(Continued from page 24)

is true that the second is better. It is more interesting, and I don't believe this is so merely because of the diagonal line in the composition as against the merger of the flower pot and Michael Kanin's head.

Technique is neither the beginning nor the end. It is something that has to be learned and then in part forgotten, and then relearned and discarded all over again—an endless process. Who really cares anyway that these two pictures were taken with a Rolleiflex, 1/100 second exposure at F:16? This information wouldn't interest a professional photographer, for the chance of taking the same people in the same light in the same place will never occur again. You will learn your own technique by what comes off and what doesn't come off.

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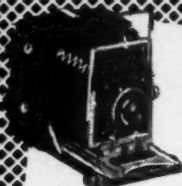
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